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Investigations
ON
CLINICAL THERMOMETRY:
CONTINUOUS AND QUASI-CONTINUOUS TEMPERATURE RECORDS IN MAN AND ANIMALS IN HEALTH AND DISEASE.

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PART II.*—THE THERMO-COUPLE THERMOMETER.

IT will be gathered from perusal of Part I. that the relation of temperature to disease has been studied and recorded so fully that an enormous mass of literature on the subject must have accumulated. Much of this literature is of a single type and has a common origin. From time to time, however, the need of improved methods and extended observations has been brought home with great force to those engaged in practical clinical thermometry. On the one hand the measurement of extremely slight variations of temperature was demanded, whilst on the other, as the diurnal variations of temperature were demonstrated, more frequent and repeated observations became necessary. These demands have been oft repeated, and clinicians and physicists alike have exerted great ingenuity and expended much of both time and energy on the construction and working of apparatus designed to obtain continuous records of slight variations of temperature, or such records at short intervals, over prolonged periods. Discussing Allbutt's work, an unnamed writer says[59]:—

> But as the local variations are sometimes slight, although occasionally amounting to 4°, 5°, 6° F., or even more, the ordinary thermometers ..... are not sufficiently delicate to detect them readily; accordingly a thermo-electric pile capable of registering very minute variations has been constructed, and, from what we have seen, is likely to lead to highly important results.

The real value of this thermo-electric apparatus (the possibility of obtaining continuous records of the temperature in different parts of the body) is, however, passed unnoticed. Even then it had come to be recognised, and now still more is it evident, that the stage had been reached at which the mercurial clinical thermometer, a proved instrument of precision of great value in advancing medical science, could no longer be considered equal to all the demands made upon it; some method of continuous registration and recording of temperatures is called for. The mercurial thermometer, in spite of its many good points, has certain imperfections. At best it registers the maximum temperature only, within the cavities in which it is placed. The most delicately constructed mercurial thermometer, after being placed in position, indicates the maximum temperature of the tissues of the body with which it is brought into contact only after a distinct interval; the "lag" of the instrument is considerable and, as usually constructed and graduated, this thermometer does not indicate very low temperatures, whilst outside the usual range inaccuracies are almost unavoidable. With such an instrument no graphic records of any variations of the body temperature can be obtained. It can supply no information as to the variations of temperature which occur, even while it remains in position, and during the intervals between its application we are, of course, completely in the dark as to what rise or fall of temperature may be taking place. We may take the patient's temperature every four hours, but we still remain in ignorance of the course of events during the intervening four-hourly periods, and may miss the indications of a distinct but moderate tuberculin reaction or of severe internal hæmorrhage, occurring, say, after an operation.

GAMGEE'S WORK ON CONTINUOUS TEMPERATURE RECORDS.

Arthur Gamgee,[60] who during the last years of his life devoted all his energies to the production of continuous or quasi-continuous temperature records, writes:—

> The careful and detailed study of all the work done since the earlier observations of Jürgensen[64] and others on the diurnal variations of the temperature of man shows in the clearest possible manner that it can only be by the introduction of automatic and extraordinarily sensitive methods of registration that the wonderfully interesting problem of the diurnal variations in the animal temperature and their relation to *mean time*, as well as to the other conditions probably affecting it, could be attacked and solved.

Gamgee was ultimately successful in his efforts to obtain continuous temperature records, and had his life been prolonged he would have done the work on which we are now engaged. He says:—

> The motive which urged me to make the sacrifices of all kinds which this research has involved was the intense desire to study for the first time, and in an elaborate manner, the normal curve of the temperature of man, and thereafter, in the first instance, the changes which that curve exhibits during the very earliest stages of pulmonary consumption and of surgical tuberculosis when the organism is the prey of the tubercle bacillus alone and not yet subject to a "mixed infection"; for I had, by long-continued observations carried out with the clinical thermometer, ascertained the utter want of precision and insight which at present prevails in reference to the very earliest stages of phthisis, when physical signs are yet almost, or completely, in abeyance, and when the cough, the anæmia, the loss of flesh, and slight temperature abnormalities are the only guides the physician has to rely upon.
>
> The conditions under which an automatic method of registering the differences in the E.M.F. of thermo-couples could be carried out had completely changed since the days when I worked with Tait. The discovery of the moving coil type of galvanometer, which we associate with the name of D'Arsonval, but which had been initiated by the beautiful syphon-recorder of Lord Kelvin, had, to my mind, absolutely simplified the solution of the problem. Given a galvanometer practically uninfluenced by all changes in the surrounding magnetic field, and at the same time possessed of great delicacy under the conditions of the special investigation; given, besides, an extremely perfect photographic recorder; and, thirdly, given a thermostat more perfect than had ever been constructed, which should be able to maintain a thermo-couple during days and weeks at a temperature not varying more than 0·02° C.; fourthly, given thermo-couples of sufficient delicacy, and of which one set should be so arranged as to constitute respectively very perfect surface and deep thermometers, and it appeared to me that the problem must be definitely solved.

EARLY OBSERVATIONS WITH THE THERMO-ELECTRIC METHOD.

Seebeck, in 1822, noted that a difference in electrical potential was produced by raising or lowering the temperature of the "junction" of two dissimilar

* Part I. was published in THE LANCET, Jan. 22nd, p. 173.

metals beyond that of the remaining portion of a complete conducting circle in which this junction is included.

As already mentioned, following up this observation, the thermo-electric method of registering the temperature of certain parts and tissues of the animal body seems to have been used first by Becquerel and Breschet (1835),[65] who made use of a single pair of "copper-steel" couples. They investigated the temperature of tissues and certain internal organs of some of the lower animals and of man. The thermostat, in which the constant temperature couple was kept at a standard temperature, varied only 0·1° C., was devised by M. Sorel and constructed by M. Gourjon. The variable couple, provided with a sharp point, was thrust into the tissues of the animal being investigated. Although this apparatus was obviously unfitted for use in ordinary clinical work, valuable thermometric data were obtained, not only by the devisers of the apparatus, but by Dutrochet,[66] who perfected it. Dutrochet is perhaps best known for his observations on the emigration of leucocytes which preceded those made by Waller and Cohnheim.

This method was also utilised by Helmholtz[67] (who, however, employed three elements) and others for the purpose of measuring the heat developed during simple and tetanic muscular contractions.

John Simon,[68] at St. Thomas's Hospital, London, studied the temperature in inflammation, combating Hunter's conclusion that an inflamed part is not hotter than the blood which it receives, and quotes Becquerel and Breschet in support of his contention that such a part is "*considerably hotter than internal organs of the body* (which in effect would mean considerably hotter than the blood which it receives)," and he remarks "everything therefore turns on facts of comparative thermometry." To settle this uncertainty

> the writer [Simon] believes that some thermo-electric observations which he, with the valuable aid of his colleague Dr. Edmund Montgomery, has recently made in the subject may be deemed practically conclusive. And on the evidence of these experiments, he now ventures to say that an inflamed part is no mere passive recipient of heat, but is itself actively calorific.

Montgomery's thermometric apparatus consisted of a miniature thermo-electric battery made

> by the angular contact of platinum and iron; each in a single delicate bar, which, where soldered to the other, was brought to such sharpness that the end of the metallic commissure could be thrust, like a pin, into any soft animal texture. [Here Montgomery appears to follow Becquerel and Breschet pretty closely. Then] two such thermo-electric pins or batteries, connected by copper wires with one another and with a sensitive nearly astatic galvanometer, were used as a means for comparing the relative temperatures of media with which they respectively were brought into contact, and were found quite sufficient for the purpose; for when one of them was made ever so little warmer than the other, the fact was instantly indicated by a corresponding movement of the galvanometric needle.

Using this apparatus, Simon satisfied himself that the arterial blood-supply to an inflamed limb is less warm than the focus of the inflammation itself; that the venous blood returning from the same source, though less warm than the focus of inflammation, is warmer than the arterial blood supplied to the focus of inflammation; and that the venous blood returning from an inflamed limb is warmer than the corresponding current on the opposite side of the body; from all of which he concludes that an inflammatory process involves a local production of heat. These experiments carried on by Simon and Montgomery are of extreme interest, coming as they did so early in the era of thermometric methods.

THE CLINICAL THERMOPILE AND OTHER APPARATUS.

Lombard,[69] in 1866, working on the same lines, devised a thermo-couple thermometric apparatus with which he made a series of observations on the temperature of the head whilst intellectual work was being done. In 1875 this observer endeavoured, in the instrument he describes, "to combine portability and compactness with sufficient delicacy for all clinical and many physiological investigations. ..... Portions of the apparatus are not new, having been devised by the writer in 1866 and described by him in *Archives de Physiologie*, July, 1868." He gives a full description and figures of the instrument he used and divides it into five parts—the galvanometer, on the principle of that devised by Sir William Thomson; the rheostat, similar to a larger one devised in 1866 and described with figures (*op. cit.*); the two thermopiles were composed of an alloy of antimony-zinc-cadmium the "result of a long and elaborate series of researches in thermo-electricity, made some years since by Mr. Moses G. Farmer, of Boston, Mass.," coupled with bismuth as the other metal; a tin kerosene lamp and a brass stand with a horizontal arm having a clamp at its end; a compass and a magnifying glass completing the equipment. Then follow full directions for the use of the apparatus. The author first deals with cases in which the relative temperature of parts at the moment of observation only was concerned. Then he notes a prolonged experiment on the temperature of a part.

Dr. Bastian[70] remarks that "this apparatus is very easy to work, and yields accurate and reliable results"; but although Lombard improved and altered his apparatus from time to time his work never gained much favour.

In the meantime Gauntlett,[71] of Middlesbro'-on-Tees, in 1859, introduced an apparatus which he termed a chronometrical thermometer. It was devised for the purpose of keeping "a permanent record of the temperature of a ward or sick-room day and night," and consisted of a clock to which a thermometer tube is connected. This clock puts in motion a drum, to which a slip of paper is attached, on which a pencil, put in motion by the rise and fall of the mercury in the thermometer, inscribes a continuous line or curve. "This line is a permanent record of the temperature." The slip of paper is ruled with vertical lines representing the thermometer scale, and horizontal lines corresponding to the hours of the day and night.

On the publication of Lombard's description of the Clinical Thermopile Allbutt[72] referred to a similar piece of apparatus of his own. Unable to obtain one of Casella's clinical thermometers he, in conjunction with Messrs. Harvey and Reynolds, of Leeds, spent some considerable energy and time (1866 and 1867) in perfecting a portable clinical thermometer. They also tried to adapt the mercurial thermometer to surface temperature work. At first little came of their efforts, but in 1868 Messrs. Harvey and Reynolds constructed for Allbutt an instrument less perfect and elegant than, but substantially the same as, that of Dr. Lombard. It consisted of piles or couples attached to handles identical with those figured by Dr. Lombard, of a rheostat and of a galvanometer. The piles were of bismuth and antimony.

The rheostat was far inferior to Dr. Lombard's and the galvanometer less perfect in detail. I am told by physicists that my instrument was as good as could be had at the time. ..... I constructed it with the help and advice of the first physicists of the day. I am also told that much of the excellent detail in Dr. Lombard's calculations was scarcely possible before the date of some publications by Professor Tait, of which, I regret to say, I know little. I have had my machine, such as it is, in work since 1868. [He then continues:] The connecting wires, &c., made it too cumbersome for ward work, yet for some time I used it in the wards of the (Leeds) Infirmary and made very valuable observations in the wards which I supplemented in my chambers.

This apparatus was found to be thoroughly trustworthy as a means of recording surface temperature, but Allbutt came to the conclusion that, as yet, it could scarcely have a high clinical value, the most valuable results obtained being those bearing on the relations between superficial and internal heat. He was of opinion, as the outcome of his observations, that there is little, if any, constant ratio between the two, as sometimes the superficial heat would ascend with the increase of internal heat, sometimes it remained stationary during such ascent, whilst again it sometimes actually descended, the ratio varying with the parts examined. He found, too, that while the internal heat is fairly constant the superficial heat is very variable. He also made a series of curious observations on the localities of sweating in hectic and similar cases.

PRESENT INVESTIGATIONS: DESCRIPTION OF APPARATUS.

In 1879 one of us, following Jürgensen,[73] working in the old Royal Infirmary, Edinburgh, and with the aid of an ordinary clinical thermometer, endeavoured to obtain quasi-continuous temperature records in cases of wound infection. Here the success obtained was no greater than was the similar experiment carried out by Jürgensen. On consulting the late Professor Tait as to the possibilities of (*a*) using thermo-couples, one of which could be kept at a constant temperature, and (*b*) devising a suitable galvanometer, it came out that the question of recording the temperature of the human subject had already occupied the attention of Professor Tait and Dr. Gamgee for some time, and that they had met with difficulties, especially as regards the galvanometer, that then appeared to be insuperable.

With the evolution of the Thomson-D'Arsonval galvanometer this difficulty was removed, and in 1908, as already noted, Gamgee[68] made his final and almost successful effort to evolve a practical method of continuous temperature recording suitable for use in the hospital ward. For his thermo-electric couples Gamgee employed copper and constantan, a combination with which he obtained excellent results. He was compelled to admit, however, that the method was, from its very perfection, unsuitable for general use on account of the extreme delicacy of the apparatus, and, further, because of the necessity of employing a very elaborate and susceptible thermostat. On Gamgee's death we were impelled to return to this work and to commence a series of new investigations on the variation of the internal and surface temperatures of patients. Fortunately for us we were enabled, through the courtesy of Mrs. Gamgee, to gain access to Gamgee's apparatus, and with it to continue his investigations on the diurnal variation of temperature of the healthy human being, and then to take up the action of hot and cold fluids introduced into the stomach, and, finally, the effect of certain drugs, especially alcohol.

FIG. 1.

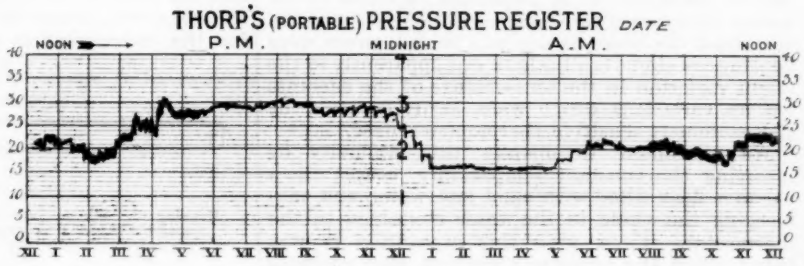


Chart showing variation of pressure of gas supplied to heating burner for thermostat.

Although it was found that Gamgee's forecast as to the relative unsuitability of the photographic method for ordinary work and the use of thermo-couples with the necessary constant temperature apparatus was to a certain extent justified, we were able, with the help of an air-toluol-mercury thermometer, thermos flasks, and gas-pressure regulators, to obtain extraordinarily good results. Moreover, the experiments made with the thermo-couples were so successful and opened up such possibilities that we decided to continue investigations along two lines, and in the present paper we record improvements, or at any rate simplifications of, and additions to, Gamgee's apparatus by means of which we were enabled to eliminate certain errors and to obtain more consistent records; we then discuss our results obtained with the resistance thermometer.

FIG. 2.

Photograph of image of rising and falling column of mercury, showing the diurnal variation of temperature of the thermostat, which is never greater than 0·01° C. The shaded portion indicates the clear space above the mercury meniscus. (Read the figure from right to left.) The vertical white lines indicate time and were marked by switching off the light for two or three minutes. Note the delay in rise of temperature which occurs some five or six hours after the rise of gas pressure. (Couples and thermometer in vacuum flask in thermostat.)

The Thermostat.

In our earlier experiments we used the thermostat constructed by Gamgee [3] but were at once confronted with a difficulty. Although the temperature of the water was always the same at any given time on consecutive days, slight variations were undoubtedly recorded at different periods during any one day, this being due, in part at any rate, to the varying pressure of the gas supplied to the burners (see Fig. 1) which with great regularity rose in the evening and fell in the morning. Even with a specially constructed gas regulator we failed to eliminate these variations and we turned our attention to other factors in the problem. It was then found that in the temperature of the water in the thermostat, agitated by the rotary pump used by Gamgee, although the mean remained the same at any one period, there were continuous slight oscillations, due apparently to the slight variation in the temperature of the currents set up, variations which were easily detected by the extremely sensitive thermometer used.

We attempted to obviate this difficulty by inserting the constant temperature couple in a vacuum flask filled with sand and water and submerging the whole in the water contained in the thermostat. Even with this precaution it was found, when the pump was working, that currents varying in temperature were easily demonstrated. To overcome this difficulty the couple and a delicate thermometer were tied into the vacuum flask by means of insulating tape, the neck of the flask being sealed with tinfoil in such fashion that any disturbing elements, due either to currents set up by the pump or to convection, were done away with; and as the pump had now become a complicating factor its use was discontinued.

In determining the variations of temperature in the vacuum flask the following method was used. A beam of light from an electric lamp passed through a cylindrical condenser was focussed on the stem of the delicate mercurial thermometer, and then, by means of a couple of lenses on a drum revolving once in 24 hours and covered with sensitised (bromide) paper, the whole being placed in a small dark room or camera. An inverted image (Fig. 2) of the thermometer with the horizontal lines marking 1/100° C. (0·01° C.) and the shadow of the column of mercury was thus obtained, and with this apparatus a complete photographic record of any excursion of the mercury during the 24 hours could be obtained, the horizontal markings of the thermometer being photographed at the same time and giving the nature and extent of the excursions. Several such records were taken, and with most concordant results, the temperature rising each night and as regularly falling each morning. These variations did not, however, correspond in time to the variations in gas pressure as they did before the vacuum flask was introduced, the temperature was steadier, and the fluctuations were not only smaller, but were considerably delayed. This, of course, was anticipated.

The temperature of the water in the vacuum flask, and therefore in the enclosed thermo-couple, varied only 1/100° C., or 1/55° F. (0·018° F.), during the 24 hours, the variation, considerably delayed, however, corresponding to the alteration of the gas pressure. During many hours of the day there was no variation and any variation that occurred took place very slowly. There is indeed no rapid change of even 1/100°, and during any short period the variation never exceeded 1/1000° C. (0·001° C.)—certainly a negligible quantity. Since for our purpose the reading of a patient's temperature to 1/50° C. (0·02° C.) is more than sufficiently exact, the temperature in the thermostat is practically constant. Nevertheless, if greater accuracy should be required, knowing the time at which the temperature varies 1/100° C., it becomes simply a matter of calculation, after making the necessary allowance, to give the exact temperature of a patient at any period in the 24 hours.

Thermo-couples.

When we had completed the first few of our experiments it became obvious that there must be a considerable "lag" in the thermo-couples used by Gamgee and illustrated by him in his paper; this on account of their great mass—the greater the mass to be heated the longer the time required for the instrument to give a correct record. In some cases we found that the registration of the correct temperature did not take place until 30 to 45 minutes after the thermometer had been inserted. An ideal thermo-couple, or one approaching nearest to the ideal, must have as little mass as possible and must resist the action of warm water and sweat; the material surrounding the couple must be a non-conductor of electricity and, at the same time, must be flexible, though sufficiently rigid to prevent undue movement; otherwise the delicate wires of which any workable couple must be constructed will soon snap.

FIG 3.

Drawing of "skin thermometer," showing the wires composing the thermo-couple embedded in, and held in position by, a vulcanised rubber-canvas support.

Our best results were obtained with a couple (Fig. 3) consisting of a fine copper wire, 0·004 in. in diameter soldered to a similar constantan wire between two stout pieces of indiarubber (canvas emdedded in rubber and vulcanised) 2 in. × 0·25 in. × 0·06 in. to 0·12 in., the couple or junction of the two wires being exposed on the surface of the rubber. This material was selected only after a number of substances had been experimented with and rejected: vulcanised fibre, mica in thin sheets, celluloid and enamel, each of which had to be discarded for various reasons, the chief of these being that they did not withstand the action of warm water and sweat. When placed in contact with the skin most of them tended to buckle up, and in spite of the fact that the delicate wires forming the couple were constructed in spiral form in order to relieve any accidental tension, they almost invariably snapped as soon as the buckling took place; and although, owing to their lack of great mass the lag was almost eliminated, we discontinued the use of any of these materials but the vulcanised rubber. To the ends of the fine "couple wires" similar wires of greater

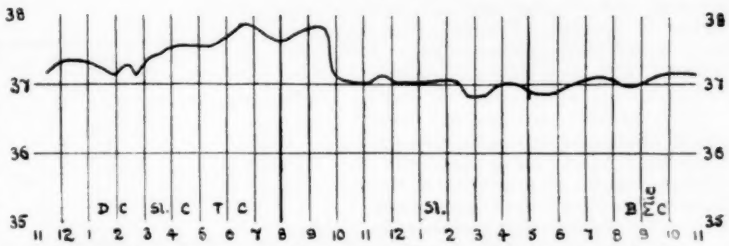
FIG. 4.

Drawing of "rectal thermometer," showing the wires comprising the thermo-couple embedded in the eye of a No. 6 catheter, and held in position by hardened rubber solution.

diameter are soldered, and to these latter are attached still stronger leads, these in turn being connected to the recording instrument.

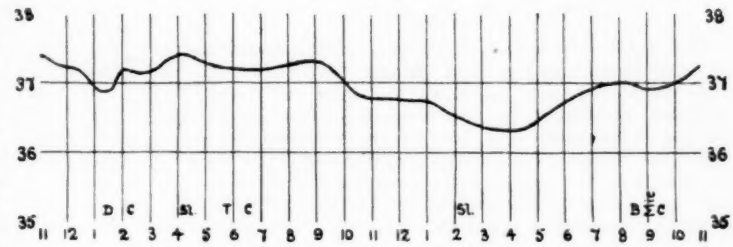
In a thermometer of this type the lag is less than a couple of minutes, the instrument is flat, not too large, easily fixed to the skin in the axilla or groin or, indeed, any part of the body, by means of a little strip of plaster; and, causing no inconvenience to the patient, is admirably adapted for taking surface temperatures. We found that the truss method of fixation employed by Gamgee was not satisfactory, in that the thermometer, even with the best fitting truss, cannot be maintained in continuous contact with the skin, and the instrument becoming slightly displaced, air rushes in, with the result that the couple is instantly cooled and there is a sharp fall in the record line. Further, it must be remembered that with the method of fixation suggested above the actual skin temperature is not recorded, as the moment a piece of adhesive plaster or a bandage is placed in position over the instrument, evaporation and radiation are prevented and the skin temperature rises. Any failure of contact is at once manifest on the Darwin thread record and the thermometer can be readjusted at once. In the records here presented the relative variations may be accepted as being fairly accurately measured, though it cannot be claimed that the absolute temperature is recorded.

FIG. 5.



Thermo-couple record of groin (skin) temperature of a healthy man. A, Awake; B, Breakfast; C, Cigarette; D, Dinner; M, Glass of milk; O, Thermometer removed for a short time; R, Reading; S, Supper; T, Tea; W, Washed; Ap, Apple; Mic, Micturition; Sl, Asleep; S.M, Glass of soda and milk.

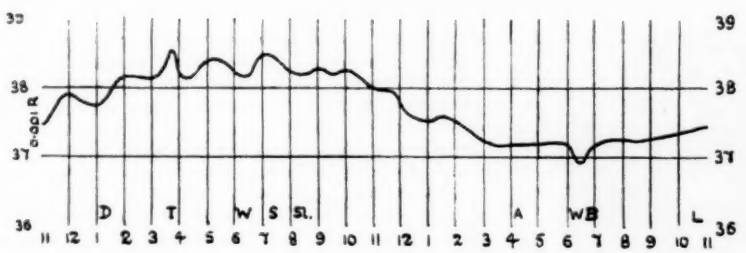
FIG. 6.



Thermo-couple record of rectal temperature of a healthy man.

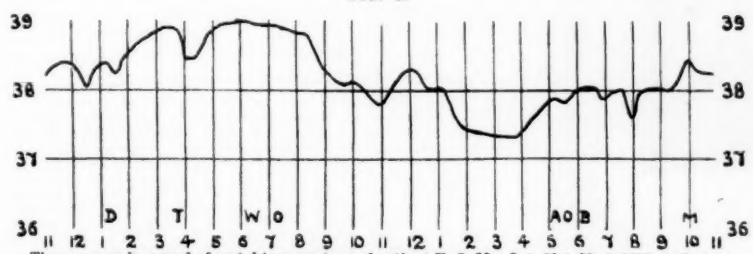
In the construction of the rectal thermometer (Fig. 4) the strip of rubber is replaced by a soft No. 6 rubber catheter, the couple or junction being embedded in the eye of the catheter and the surrounding space filled with rubber solution, which is allowed to "dry." The junction is brought flush with the surface of the rubber tube, where, although fully exposed, it can do no damage to the wall of the rectum, and, causing no inconvenience to a patient, once inserted it may be left in position for 24 hours or more. The wires leading from the open end of the catheter may be easily attached to the thighs by strapping and led in spirals from the bed to the recording apparatus; there is then no danger of the catheter being displaced or of the wires snapping under undue tension. Under these conditions the subject of the experiment is able to move in bed as much as can reasonably be desired. He may even be able to get up for a short time during either the day or night without interfering materially with the continuity of the record. The lag is just as slight as in the skin thermometer—two minutes—at the end of which time the recording instrument invariably registers the correct

FIG. 7.



Thermo-couple record of rectal temperature of patient J. S., Oct. 23rd–24th, 1912, suffering from pulmonary tuberculosis. This record was transmitted over wires from Addenbrooke's Hospital to the Pathological Laboratory in Downing-street, about one-third of a mile away.

FIG. 8.



Thermo-couple record of rectal temperature of patient E. J. M., Oct. 21st–22nd, 1912, suffering from tuberculous peritonitis. The record was obtained in the same way as No. 7.

temperature. Usually two separate records were taken, one of the groin temperature † and one of the rectal temperature. (Figs. 5 and 6.) These will be discussed later.

Although most of the experiments were conducted in the laboratory, with the subject and the apparatus in the same room, a number of the records (see Figs. 7 and 8) were made in the laboratory with the patient in bed at Addenbrooke's Hospital some 600 yards away, the thermostat being stationed in the hospital near the patient and the leads being insulated and brought in a special cable to the laboratory.

Fig. 9.

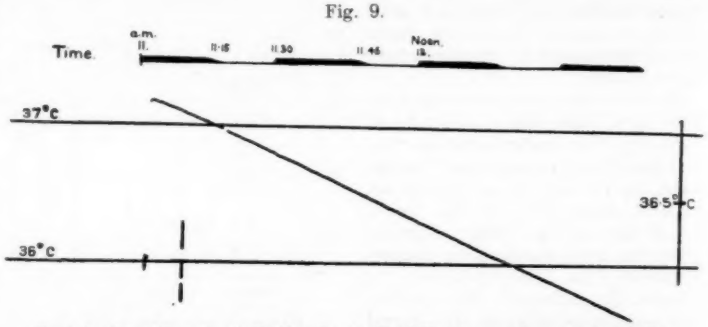


Chart showing oblique line indicating the steadily falling temperature of water cooling in vacuum flask; it serves as a standard with which to compare the temperature curves illustrating this paper.

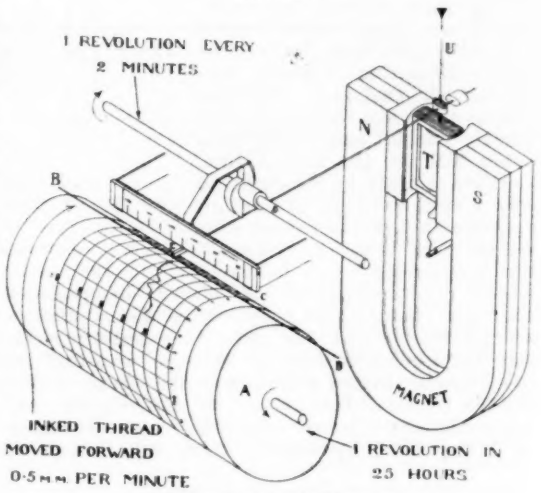
Testing the Couples.

Using different forms of thermo-electric couples, or thermometers, it was found necessary at first to test each one of them, their resistance varying according to the thickness and length of the wire used. It is an easy matter, however, to make this resistance constant by the insertion in the circuit of a manganin resistance box and bringing the resistance of the system to some definite figure, say 100 ohms.

In the earlier experiments, each couple as it was made was standardised. To do this an ordinary thermos flask is filled with water at a definite temperature—say 97° F. or 37° C.—this being determined by a very delicate accurately graduated mercury thermometer marked off in 1/100° C. inserted in the flask. The couple is then introduced into the flask, and after an interval of one minute the temperature as indicated by the mercury thermometer is noted. The galvanometer circuit is closed by means of a switch and the temperature recorded by the deviation of the galvanometer mirror when Gamgee's photographic method is used, or of the lever when the Darwin thread-recorder is employed. The water in the thermos flask cools very slowly, especially when a plug of cotton-wool is placed in the neck of the flask. When a fall of half a degree is recorded by the mercury thermometer the circuit is broken, and this is repeated for every half degree until there has been a fall of

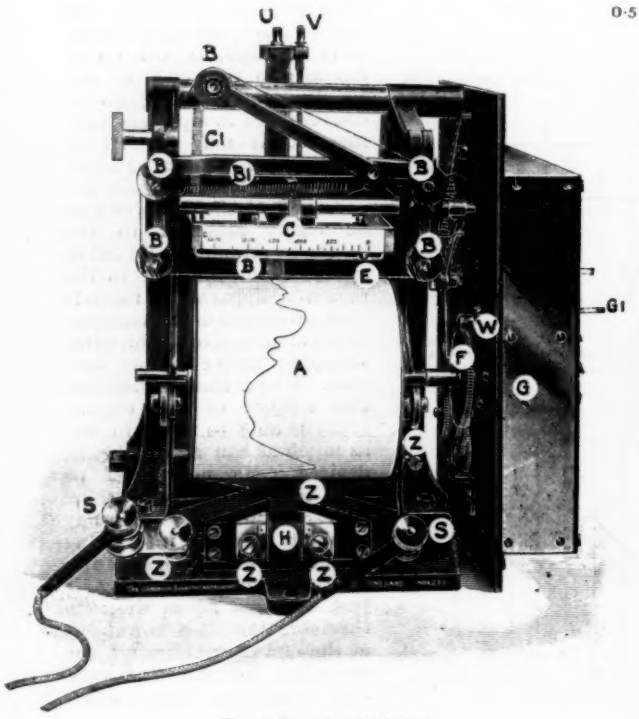
† After a few experiments we discontinued the axillary record, as we found it impossible to keep the thermometer in proper contact with the skin for any prolonged period. For short periods admirable records could be obtained, but the patient soon tires of keeping his arm fixed. The difficulty in the lower limb is not so great, as even with considerable movement of the leg or thigh little displacement of the thermometer occurs and there is no inrush of cold air.

FIG. 10.



Essential parts of the thread recorder.

FIG. 11.

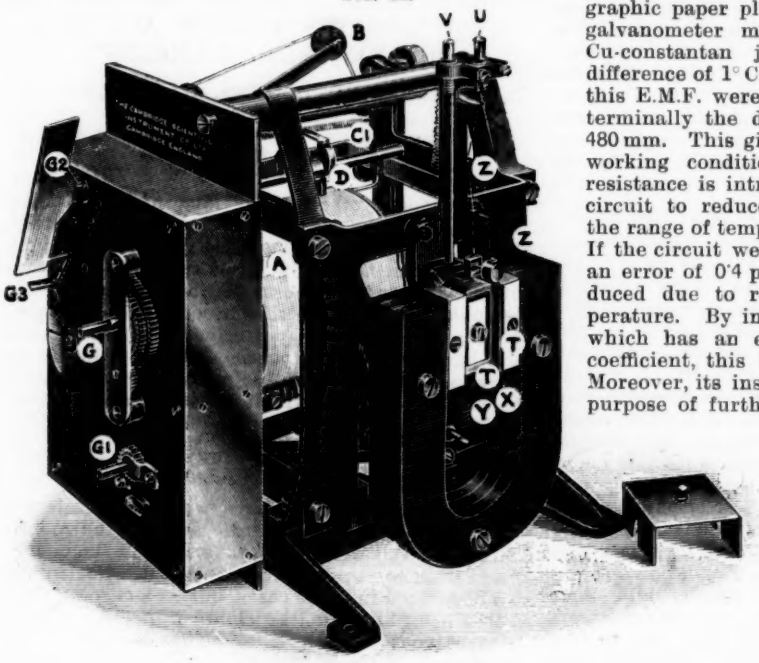


Thread Recorder, front view.

DESCRIPTION OF LETTERING ON FIGS. 11, 12, AND 13.

A, Drum on which temperature is charted. B, Inked thread. B', Spring keeping inked thread taut. C, Presser-bar on which scale is marked. C', Spring raising presser-bar. D, Cam rod with two cams (rod revolves once in 2 minutes, presser-bar lowered once per minute). E, Knife edge at end of galvanometer lever. F, Gear wheels to alter rate of revolution of drum. G, Driving clock. G', Slave clock. G^2, Fly wheel. G^3, Fly wheel stop. H, Resistance coil now combined with thermometer leads so that any thermometer may be used. I and I', Zero plugs. K and K', Recording plugs. L, Calibrating plug. M, Slide wire for calibrating. N, Dummy leads. O, Thermometer leads. P, Thermometer. R, Battery leads. S, Combined leads. T, Suspended coil. U, Suspended wire or torsion head. V, Clamping screw. W, Wire engaging with cam. X, Magnet. Y, Connecting lead. Z, Frame.

FIG. 12.



Thread recorder, back view.

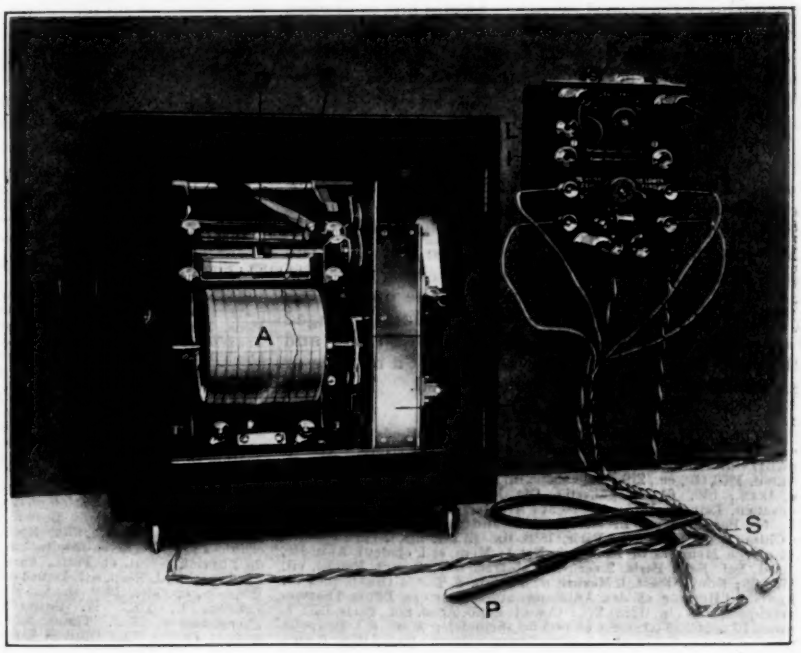
two or more degrees. We then have on the record a falling straight line† divided into half degrees, these marking off sufficiently accurately the recorded temperatures (see Fig. 9).§ This marked line serves as a standard, and the degrees may be marked off on any subsequent record taken from a patient, provided that the same thermometer is used, that the galvanometer is not interfered with, and that the thermostat temperature remains constant.

The Recording Apparatus.

In all our earlier experiments we used the photographic recorder devised by Dr. Gamgee and described in his paper[68] and again by one of us.[73] The resistance of the galvanometer we use for the photographic method is 10·5 ohms, this giving a deflection of 512 mm. per micro-volt when recorded on the photographic paper placed 116 cm. distant from the galvanometer mirror. The E.M.F. given by Cu-constantan junctions for a temperature difference of 1° C. is the mean 40 micro-volts; if this E.M.F. were applied to the galvanometer terminally the deflection would be $12 \times 40 = 480$ mm. This gives a sensitivity too great for working conditions, and to overcome this a resistance is introduced into the galvanometer circuit to reduce the sensitivity, according to the range of temperature, to the required figure. If the circuit were composed entirely of copper an error of 0·4 per cent. per 1° would be introduced due to resistance variation with temperature. By introducing manganin, however, which has an exceedingly small temperature coefficient, this becomes practically negligible. Moreover, its insertion in the series serves the purpose of further reducing the error due to resistance changes. It is obviously desirable, in order to avoid errors due to thermo-electric effects, to have as few dissimilar metals as possible in the circuit. The galvanometer terminals therefore are made of copper, and a copper wire is run from the frame terminal to the top of the suspension and there attached, thus eliminating any possible effect due to the brass carcase of the galvanometer.

Galvanometers of this type are very susceptible to vibration, and a special stand or frame in which the galvanometer is suspended[73] had to be devised. The whole apparatus, as above noted, gave excellent results. It is, however,

FIG. 13.



Complete temperature "outfit" as used in most recent experiments.

† The line is not absolutely straight, for as the temperature of the thermos flask approaches the temperature in the thermostat, the line develops a slight curve.

§ To develop the bromide paper record lay it on a flat board and pass over it a wad of absorbent cotton-wool soaked in "developer" until a good image is obtained. Then wash, fix in hyposulphite of soda, again wash, and allow to dry.

very cumbrous, and requires for its use a special dark room, whilst facility in its manipulation can only be acquired and retained by much and continued practice; and after we had used it for some time we decided, after consultation with the Cambridge Scientific Instrument Co., to whom we are greatly indebted for most valuable advice and assistance, to discontinue the photographic continuous recorder in favour of the thread (quasi-continuous) recorder devised by Mr. Horace Darwin.

The Quasi-continuous Temperature Record.

The thread recording apparatus consists essentially of a sensitive recording galvanometer of the D'Arsonval type so arranged that it gives a series of records of the instantaneous deflections of a galvanometer pointer at very short intervals, the method employed having the advantage that all pen friction is avoided. In Figs. 10, 11, and 12 are shown the essential parts of the recorder, consisting of a galvanometer pointer E, turning about its axis and overhanging a drum, A. Between the pointer E and the drum, parallel to its axis and a short distance from its surface, an inked thread, B, is stretched. A presser-bar, C, is situated above the galvanometer pointer, from which it is normally held free by a cam, D. At regular intervals this cam makes a half revolution, first allowing the presser-bar to fall upon the pointer and then raising it free of the pointer. As the presser-bar falls it brings the pointer down on to the drum, nipping the inked thread between the pointer—on the under side of which is a knife edge—and the paper, when a dot is left upon the paper at the point of intersection of the pointer and the inked thread. We have thus a visible record of the deflection of the galvanometer at the instant when the presser-bar falls. The galvanometer pointer is so hinged that it can be depressed without any bending of the suspension, whilst in the intervals between the production of the dots the galvanometer is free to take up its true deflection without frictional errors. As the dot is always produced where the thread and the pointer intersect, it is obvious that by suitable arrangement of the galvanometer coefficients, paper with rectangular coördinates of uniform scale can be used. (See Fig. 10.)

The clockwork arrangement G is divided into two parts, the "drum clock" (G) and the "slave clock" (G^1) (Figs. 11 and 12). The drum clock drives the drum A at a definite speed of one revolution in 25 hours or of one revolution in 2 hours and 5 minutes, according to the setting of the gear wheel F. The slave clock drives the cam shaft and cam D, and thus operates the presser-bar C. A removable cam on the drum clock engaged with a wire (W) is driven by the slave clock and allows it to rotate at intervals of half a minute or one minute, according to the cam used.

(To be continued.)

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[*Continued at foot of next column.*

PRELIMINARY NOTE ON THE USE OF GYNOCARDATES ORALLY AND SUB-CUTANEOUSLY IN LEPROSY.

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Chaulmoogra oil has for long maintained its reputation as the best known remedy for leprosy, although it is so nauseating and interferes so much with digestion that only rarely can it be borne in sufficient doses to be more than a palliative in this obstinate disease. On this account for a number of years past I have prescribed gynocardic acid (also known as chaulmoogric acid and believed by many to be the active principle of the oil) in place of chaulmoogra oil, which contains a large proportion of almost certainly useless palmitic acid.

Cases Treated with Gynocardic Acid and Gynocardate of Soda Internally.

In three patients who have been able to tolerate large quantities of gynocardic acid by the mouth I have seen remarkable improvement in the course of a year or two under such treatment. Nastin has also been used in these cases, but as a careful trial of this drug alone in the Gobra Leper Asylum at Calcutta convinced me that it was nearly, if not quite, useless, I attribute the improvement in the patients referred to as due to persistence with gynocardic acid.

CASE 1.—The first of these cases was a very extensive macular leprosy with tubercular affection of the face. I have seen the patient quite recently after over two years' treatment, and at the present time the macular lesions on the body and extremities, in which I found numerous leprosy bacilli at first, have almost entirely disappeared, and the only visible change remaining is slight redness and thickening of the skin of the face and forehead. Nastin was also used in this case and may possibly have had some share in producing the improvement. Leprolin was followed by an increase of lesions.

CASE 2.—The second patient was a mixed tubercular and anæsthetic leprosy, with numerous raised macules on the body and extremities, tubercular affection of the face, and thickening of the left ulnar nerve, with extensive anæsthesia

Continued from preceding column.

(cited by Gamgee). 66. Dutrochet (1840): Rech. s. l. Chaleur propre des Etres Viv. à Basse Tempér., Ann. de Sci. Nat., Paris, 2 sér., Botanique, xiii., 5, 65. 67. Helmholtz: Ueber d. Wärmeentwick. b. d. Muskelaction; Müller's Archiv, Berlin, 1848, p. 144, and article on Warmth in Encyklop. Wörterb. d. Med. Wiss., Berlin, xxxv. (1846), 523. 68. Simon (1860): Article on Inflammation in Holmes's System of Surgery, London, i. (1860), see especially pp. 40-53. 69. Lombard: Description d'un Nouvel Appareil Thermo-électrique pour l'Etude de la Chaleur Animale, Arch. de Physiol. Norm. et Path., Paris, 1868, i., 498. Description of a New Portable Thermo-electric Apparatus for Med. and Physiol. Investigations, Brit. Med. Jour., London, 1875, i., 98. Exper. Researches on the Temp. of the Head (abstr.), Proc. R. Soc., Lond., 1878, xxvii., 166. Exper. Researches on the Regional Temperature of the Head, under Conditions of Rest, Intellectual Activity and Emotion, London, 1879. Experim. Researches on the Propagation of Heat by Conduction in Bone, Brain-Tissue, and Skin, abstr. in Proc. R. Soc., London, 1881-2, xxxiii., 11; ibid., 1882, xxxiv., 173. Exper. Researches on the Propagation of Heat by Conduction in Muscle, Liver, Kidney, Bone and Brain (abstr.), ibid., 1886, xl., 1. Other papers by Lombard that may be consulted are:—On the Temp. of Some of the Invertebrates, N.Y. Med. Jour., 1865-6, ii., 241. Experiments on the Relation of Heat to Mental Work, N.Y. Med. Jour., 1867, v., 198. Analysis by Brown-Séquard in Arch. d. Physiol. Norm. et Path., Paris, 1868, i., 670. Rech. Expér. s. quelques Influences non étudiées jusqu'ici de la Respiration s. l. Temp. du Corps Humain, Arch. de Physiol. Norm. et Path., Paris, 1868, i., 479-506. Rech. Expér. s. l'Influence d. l. Resp. s. l. Temp. du Sang dans son Passage à travers le Poumon, op. cit., 1869, ii., 5. 70. Bastian (1875): Brit. Med. Jour., London, i., 116. 71. [Gauntlett] (1859): The Chronometrical Thermometer, Med. Times and Gaz., London, xviii., 264. 72. Allbutt (1875): The Clinical Thermopile, Brit. Med. Jour., London, i., 309. 73. Woodhead (1911): The Action of Alcohol on Body Temperature and on the Heart (Norman Kerr Memorial Lecture), Brit. Jour. Inebriety, London, ix., 109.

of the hand and forearm and atrophy of some of the small muscles of the hand. This patient persevered with the internal use of large doses of gynocardic acid in addition to nastin injections, and gradually increased the dose until he took 40 grains a day, although it caused great flatulence and discomfort. Sodium gynocardate was more easily tolerated by this patient than the acid. Within a year all the macules had disappeared, and the facial appearance, which had been very typical, had so greatly improved that even an expert could not have recognised the disease apart from the nerve lesions. For over a year now frequent examinations have failed to show any leprosy bacilli. A considerable degree of both sensory and muscular paralysis of the left hand and wrist, however, remained, doubtless due to destruction of some of the nerve fibres, although the thickening of the ulnar nerve could no longer be felt. This is the most remarkable improvement I have ever seen in leprosy.

CASE 3.—The third case was a well-marked macular leprosy with extensive thickened and discoloured patches on the face and forehead as well as to a less extent on the body and extremities. Here again gynocardic acid by the mouth was persisted with for a year, at the end of which time very great improvement had taken place, most of the patches on the body and extremities having disappeared, while the face no longer showed marked thickening, although still more red than normal. Nastin was also used and for a short time X rays, to which some of the improvement may be due.

At this stage of my work I read with much interest Dr. Victor G. Heiser's most promising account of the prolonged treatment of leprosy by intramuscular injections of chaulmoogra oil together with resorcin and camphorated oil. Shortly after Dr. Heiser visited Calcutta and paid me the high compliment of asking me to take up work on the treatment of leprosy. I showed him the second patient referred to above, and said that in view of the experience detailed above and his results with injections of chaulmoogra oil I would try gynocardates in the form of an injection, and during the last six months I have been pursuing this line of study under the very favourable conditions as regards material presented by Calcutta. As more rapid improvement than I have ever seen before under any other treatment has already resulted in a number of cases this preliminary note is published without waiting the very long period of time which must elapse before the final effects of the treatment can be ascertained, in order to allow others with greater opportunities and leisure to give it a trial.

The Preparations Used.

As gynocardic acid was found to be unsuitable for injection on account of its insolubility, I obtained the sodium and potassium salts, both of which proved to be readily soluble in water, while the solutions were not changed during sterilisation by heat or the addition of ½ per cent. carbolic acid for their preservation. The potassium salt dissolved somewhat more readily than the sodium one, but the former is less convenient in handling on account of its buttery consistence. A small quantity of Merck's sodium gynocardate produced very little pain on being injected subcutaneously, infinitely less so than Heiser's chaulmoogra oil mixture intramuscularly. A preparation of sodium gynocardate of Martindale's, however, caused a good deal of pain when injected subcutaneously in the upper arm with swelling at the site for several days. This appears to be due to its containing palmitic acid as an impurity, as when the latter was removed by chemical processes very little local reaction was produced by the pure drug. It is interesting and important to observe that the "waste product" left after extracting chaulmoogra oil was found to contain nearly 50 per cent. of gynocardate of sodium, several times as much as could be extracted from the oil itself, so that in obtaining the oil it appears that the best part of the seed is thrown away, much as in the case of ipecacuanha *sine* emetine. The gynocardates obtained from these various sources all gave the typical reaction of chaulmoogra oil with sulphuric acid—namely, a brown colour changing to green. The only preparation of chaulmoogra oil which gave no trace of this reaction was the proprietary substance known as leprolin, which is thus probably useless. I am very greatly indebted to Rai Chuni Lal Basu Bahadur, I.S.O., professor of chemistry in the Medical College, Calcutta, for all the trouble he has taken in preparing the above-mentioned pure samples of gynocardate of sodium for me.

The Effects of the Subcutaneous Injections of the Gynocardates.

Early in July, 1915, I commenced treating several cases of leprosy which Major R. E. Lloyd, I.M.S., kindly obtained for me from out-patients at the Calcutta Medical College, as well as some at the Gobra Leper Asylum. For the first three months I used almost entirely an impure preparation of sodium gynocardate, which was all I could get, but the patients, nearly all of the coolie class, came regularly for the injections once a week in spite of the marked local reactions they caused for several days, which prevented more than one- or two-grain doses being given, and distinct improvement was noted in nearly all of them within that time. Since I have been able to obtain a supply of the pure drug during the last three months the doses have been increased up to a maximum of four grains once or twice a week, and it is probable that considerably larger doses may be given with advantage either subcutaneously or intramuscularly.

In this note I only propose to give a brief general account of the effects which have followed the treatment, as it is far too early to draw any conclusions as to whether the improvement so far seen will continue, much less whether cures will eventually be obtained.

Anæsthetic Cases.

Dr. Heiser got the best results with his chaulmoogra oil injections in nerve cases, and most of my earlier cases, which have been longest under treatment, were of this type. In the second patient, referred to above as having improved so remarkably under large doses of gynocardic acid internally, injections of gynocardate of sodium twice a week in from 1 to 2 grain doses were followed by marked further diminution of the anæsthesia and return of heat and cold and tactile sensation, as well as some further gain in muscular power, within two months, although his condition had been practically stationary for several months previously. In another purely anæsthetic case, with extreme nodular thickening of the ulnar nerve, marked increase in sensation coincided with a disappearance of the irregularities on the nerve and very great diminution of the general thickening. In a second case with vesicles on an anæsthetic area bounded by a raised thickened edge and a small ulcer on another pale patch, both lesions healed rapidly, the thickening disappeared, and the anæsthesia is nearly all gone, while the light patches are now barely visible. In a case at the asylum a perforating ulcer of the foot healed, and in another patient a sluggish unhealthy ulcer on the sole of

the foot several square inches in extent has been reduced to less than half its former area, and shows healthy granulations. In several other cases ulcers have healed, although in one case some new ones developed on the finger during the injections; possibly a local reaction.

Tubercular Cases.

In my earlier cases I only had one well-marked tubercular leprosy with numerous raised discoloured patches on the body and extremities and typical facial expression. The patient was a coolie who came six miles weekly for the injections. Marked improvement resulted with considerable diminution of the thickening of his eyebrows, while the raised patches on his body became shrunken and showed fine striæ due to wrinkling of the skin over the atrophying lesions. Unfortunately, after three months, during my temporary absence from Calcutta, the patient ceased to attend. During the last three months a boy, aged 10 years, with extremely well-marked tubercular leprosy and serrated edges of the ears, has been under treatment, and has received up to two-grain doses weekly: a relatively large dose considering his weight. The edges of his ears are now nearly smooth, the thickening of his forehead and face markedly decreased, and numerous fine striæ are visible over the atrophied lesions of the eyebrows, the other patients frequently remarking on the great improvement he has shown. In this, and several other tubercular cases, the leprosy bacilli have largely lost the acid-fast characters they presented at the first examination before the commencement of the treatment, and many of them are seen to be breaking up into granules, while the tubercular lesions have become much softer under the injections.

Although it is far too early to say what will be the ultimate result of the treatment, I am sure that the improvement which has been effected in a number of cases both of anæsthetic and tubercular leprosy has been far more rapid under the influence of the hypodermic injections of sodium and potassium gynocardates than under any other treatment I have tried, including nastin subcutaneously and chaulmoogra oil and gynocardic acid by the mouth.

I am fully aware that marked temporary improvement occasionally occurs spontaneously in cases of leprosy, and that degrees of improvement equal to, or even greater than, those described above have been recorded by competent observers as following the use of nastin, leprolin, and other forms of treatment, with regard to which further experience has failed to confirm the sanguine expectations derived from the earlier reports. All I would say is that my experience of the effects so far observed as following the injection of gynocardates justifies me in recommending the method for careful trial by others in view of the unsatisfactory results of present methods of treatment, with the possible exceptions of gynocardates internally as described in this paper and Dr. Heiser's intramuscular injections of his chaulmoogra oil mixture; while the considerable degree of success reported after two years' intramuscular injections of the oil makes me hopeful that the less painful injections of the gynocardates may ultimately prove to be a more rapid, effective, and convenient method of treating this most distressing disease.

Calcutta.

TWO CASES OF FOURTH DISEASE WITH RELAPSES.

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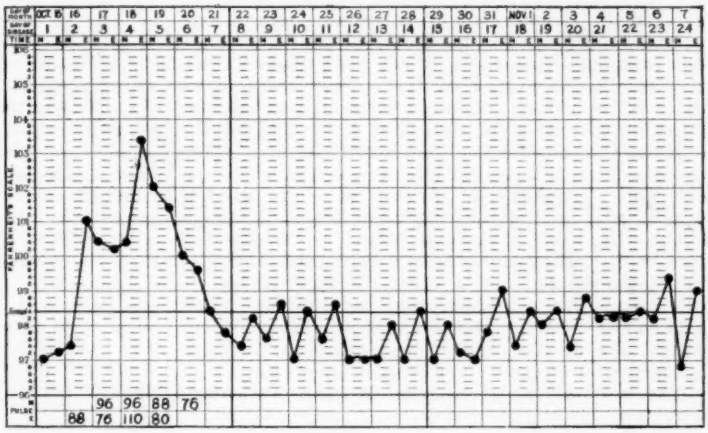
PRESENTING points of diagnostic interest, the following cases are worth recording.

CASE 1.—On Oct. 15th, 1915, Corporal ——, aged 30, of the Royal Artillery, was admitted to Lydd Military Hospital complaining of a sharp pain in the right side. The pain was located in the mid-axillary line at the level of the fifth and sixth ribs. Examination showed no physical signs to account for it. The temperature was subnormal (97° F.). On the evening of the next day there was a sharp rise of temperature to 101°, the pulse-rate being 88 per minute. The pain in the side was less and there were no other symptoms or physical signs. No signs whatever suggestive of pleurisy or pneumonia could be detected. During the 17th the temperature dropped slightly, but remained above 100°, and there was constipation, which was relieved by an aperient. On the 18th, after 36 hours, during which the temperature remitted slightly, it rose to 103·4°, with a corresponding increase in the pulse-rate to 110. The pain in the side had now disappeared, but the patient felt distinctly ill, complaining of severe frontal headache and sore-throat. The fauces were red and injected, but not very swollen. A punctate erythema appeared on the upper part of the chest and on the face. There was at no time any vomiting. The tongue was pale and slightly furred, and did not at all suggest scarlet fever. The glands in the deep cervical region were slightly enlarged and painful, especially on the right side. There was no enlargement of the posterior cervical group. On the 19th the rash had almost disappeared. The glands were larger and more tender. The malaise was less severe and the temperature and pulse declined to 101·4° and 80 respectively. On the 20th bilateral herpes labialis developed, but otherwise the patient felt much better. The rash had now quite disappeared. The temperature further declined to 99·6°. There was no albuminuria. On the 21st the temperature reached normal, but it continued to fall to 97·4° on the morning of the 22nd. This regular fall of the temperature from 103·4° on the 18th to 97·4° on the 22nd (a range of 6°) is particularly noteworthy and seems to be the same in kind although of greater extent than that seen in Case 2 (see charts). The tongue showed no sign of peeling, although this was now the fourth day from the appearance of the rash. On the 22nd the glands in the groin (examined for the first time) were found to be very much enlarged. There was slight peeling on the chest and in the palms of the hands. The patient now felt perfectly well, but was still under observation as the cases were, of course, in isolation. Nothing further appeared until Nov. 6th when there was a recurrence of malaise, while a general punctate erythema involving the whole body appeared. This rash was more marked, as well as more extensive, than that of Oct. 18th, and its appearance was accompanied by a rise of temperature to 99·4°. It coincided in time with the development in Case 2 (isolated in the same ward) of an acute attack of tonsillitis. Rash and malaise again decreased on the following day, when a slight attack of diarrhœa set in which was quickly arrested by the administration of bismuth carbonate. On Nov. 9th the patient was discharged from hospital feeling quite well. During three weeks which then elapsed before he left this station he was frequently seen and no further relapse seems to have occurred.

CASE 2.—On Oct. 19th (four days later than Case 1) Gunner ——— of the same unit, although living in a different hut, was admitted to hospital. He complained of sore-throat, headache, malaise, and rash. The temperature was 100° F. and the pulse 98. The throat was red and injected, and there was a punctate erythema all over the body and legs. He complained particularly of severe frontal headache and vague pains in the joints. The temperature rose that evening to 100·4°. On the 20th the rash had almost disappeared and the malaise was less. The temperature declined to 98·8°, though the pulse kept above 90. On

the 21st he was much better. The rash had now disappeared and the temperature had fallen to below normal. The tongue was of the typical "strawberry" variety. On the 22nd, enlarged glands were discovered in the groins though not in the cervical region. There was no desquamation. The 23rd and 24th were uneventful. On the 25th the temperature rose to 99·6° and the pulse to 100. On the 26th the temperature increased to 101° and the pulse remained at 100. Cramp-like pains in the back and legs were complained of and at the same time the face began to peel vigorously and there was marked conjunctivitis. On the 27th the fever subsided rapidly and the patient again felt well. There was a slight rise of temperature to 99° on the 30th and on Nov. 3rd. On the 6th (exactly synchronising with the second rash in Case 1) the temperature rose to 104°, with considerable malaise. There was, however, no rash, but both tonsils were acutely inflamed. This attack subsided under local treatment and salicylates. On the following day the temperature fell rapidly to normal. On the 8th there was very marked peeling of the hands and feet (in large flakes as much as half an inch in diameter). Rises of temperature occurred on the 8th, 9th, 12th, 13th, and 17th, but only to 99°. The patient was discharged from hospital on the 18th, by which time the peeling had practically finished, he then feeling quite well.

CHART 1.



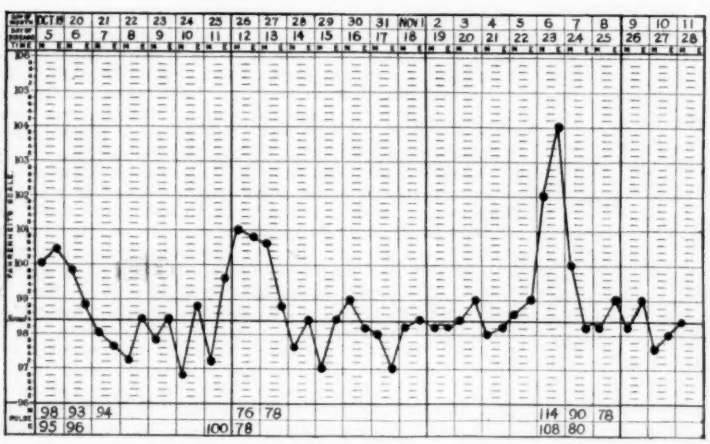
Neither of these cases gave rise to any infectious disease amongst men of the unit to which they returned.

Dr. Gordon Ward kindly examined the blood of these cases and provided me with the following report:—

Case 1.—Blood examined on fifth day after admission. Leucocytes 8400 per c.mm., polymorphs 68·8 per cent., eosinophils nil, mast cells nil, transitional leucocytes 16·6 per cent., total leucocytes 85·4 per cent., small lymphocytes 14·2 per cent., large lymphocytes 0·4 per cent., myelocytes nil, "inclusion bodies" frequent.

Case 2.—Blood examined second day after admission.

CHART 2.



Leucocytes 12 000 per c.mm., polymorphs 85·8 per cent., eosinophils 1·2 per cent., mast cells nil, transitional leucocytes 4·6 per cent., total leucocytes 91·6 per cent., small lymphocytes 7·8 per cent., large lymphocytes 0·6 per cent., myelocytes nil, "inclusion bodies" frequent.

It is generally agreed that scarlet fever is associated with a leucocytosis in all early stages, and that the eosinophils do not disappear as is common in other types of leucocytosis. In measles leucocytosis disappears as the rash comes out, but the absence of eosinophils which characterised the invasion period persists. German measles shows changes similar to those met with in measles, but to a less extent.

"Inclusion bodies" are invariable in scarlet fever, but may also be met with in any severe infection. They were very frequent in both these cases. The blood in the "fourth disease" (as described by Dr. Clement Dukes of Rugby) does not seem to have been studied. The examinations recorded above seem to exclude measles and German measles, and to that extent to favour scarlet fever. Taken with the clinical features of the disease they do not exclude fourth disease, and, if it is to be regarded as most nearly allied to scarlet fever, tell in its favour.

In considering these two cases the question arises of a satisfactory diagnosis between scarlet fever, German measles, and fourth disease. Dengue was also considered because the second patient had suffered from dengue about a year previously. The blood examination and the existence of Case 1 seemed, however, to negative this hypothesis. Against scarlet fever may be mentioned the long invasion period (four days instead of one), the fact that the pulse was in proportion to the temperature, whereas in scarlet fever the pulse is disproportionately high, the involvement of the inguinal group in the glandular enlargement, the absence of circumoral pallor, the absence of albuminuria, the absence of vomiting, the presence of conjunctivitis in one case, the small degree of faucial inflammation, and the occurrence of pleurodynia as a premonitory symptom. Against German measles may be mentioned the absence of enlargement of the posterior cervical group of cervical glands, the severity of the malaise, the headache and pains, the degree of desquamation (this being rarely present in appreciable degree in German measles), the seasonal incidence (German measles being a

disease of the early part of the year), the strawberry tongue in one case, and the fact that neither case had a rash such as one usually meets with in German measles. I am inclined, therefore, to consider these two cases as being examples of the fourth disease described by Dr. Dukes.

It is true that in four points (mostly non-essentials) these cases differ from Dr. Dukes's description, these being: (*a*) absence of enlarged post-cervical glands; (*b*) seasonal incidence; (*c*) severity of illness; and (*d*) relapses. But if one declines to accept the diagnosis of fourth disease, one is compelled to come to an even less satisfactory conclusion—viz., that these were cases of an entirely new and hitherto undescribed disease allied on the one hand to scarlet fever and on the other to German measles and fourth disease. That cases occupying a similar position occur with considerable frequency is known to every general practitioner and medical officer of health, although apparently very little appreciated by writers of text-books. They give rise to considerable difficulty in diagnosis and to a delay in notification of infectious disease, which may, on the one hand, lead to the sending of these cases into scarlet fever wards, and on the other, to the retention in their home surroundings of true scarlet fever cases.

The outstanding peculiarity of these two cases which, in my experience, does not occur either in scarlet fever, German measles, or fourth disease, is the relapse and recrudescence of fever. A reference to the charts will show that Case 1 had a slight remission of fever only; this probably corresponds to the first apyrexial interval in Case 2. The rise of temperature on Nov. 6th in each case appeared to be a simple (although not follicular) tonsillitis, but as it was accompanied by an extensive rash in Case 1, and was immediately followed by profuse desquamation in Case 2 (the patient having already desquamated once), one cannot but regard it as a very peculiar coincidence if this is not to be regarded as part of the original disease. Moreover, both patients had been strictly isolated—in an isolation hospital—for nearly three weeks. My own reading of these relapses is, therefore, that both cases were exposed to infection at the same (unknown) time. Both entered the invasion period about the same time, but the first patient showed premonitory symptoms (for which he was admitted to hospital), whereas the second did not. In Case 1 the first attack and relapse ran together and the temperature subsided just as in Case 2 (i.e., in a slow fall but quite regular) and at the same time. The second patient had his first relapse on Oct. 26th, while the first patient was then well. Both had their second relapse together on Nov. 6th. As an alternative one may suppose that in Case 1 there was only one relapse, which was synchronous with the second relapse of Case 2, the intermission of temperature being an accident incidental to the invasion period, which period could not be observed in Case 2. In either case the existence of any sort of relapse is interesting, more especially as there was no scarlet fever or German measles in the camp, and the question of one or both of these relapses being, in fact, some other disease altogether hardly arises. The treatment was merely symptomatic and at no time did complications threaten.

In conclusion, I wish to express my indebtedness to Captain Gordon Ward, R.A.M.C., for permission to publish these cases, and to Mr. John A. Procter, of Lydd, for assistance with treatment and observation.

ABSCESS OF THE MYOCARDIUM RESULTING IN AORTIC LEAKAGE INTO THE RIGHT HEART.

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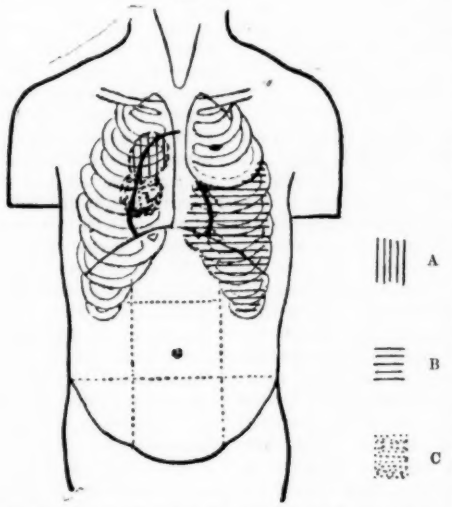
LIEUTENANT-COLONEL, C.A.M.C.;
AND
V. H. K. MOORHOUSE,
CAPTAIN, C.A.M.C.

IN the following rather unusual case there were several points of interest in regard to the physical signs. As a sequence and complication of a single shrapnel wound of the left chest involving the pleura and lung an abscess formed in the interventricular septum. This burst into the right ventricle and also into the root of the aorta, causing a communication between the systemic aorta and the right heart, with consequent leakage from the aorta into the right ventricle.

Private ——, aged 20, wounded on May 26th. He was inoculated with antitetanic serum on the next day. He remained in hospital until the evening of the 27th, being then transferred to the clearing hospital and then sent on to a general hospital where he was admitted on June 5th. On admission the temperature was 102·6° F., the pulse-rate 118, and the respirations 40. Air hunger perceptible and patient somewhat restless. Shrapnel wound in second left intercostal space anteriorly 3 inches from the mid-sternal line. Considerable limitation of movement of the left chest. On percussion of the left chest dullness was found below the fifth rib in front and below the seventh or eighth rib behind. Above this line there was increased resonance. Right border of heart 2½ inches to the right of the midsternal line, where dullness merged with liver dullness. Heart sounds normal. There was some rusty sputum, which occasionally was bright red. A diagnosis of hæmothorax with wound of the lung was made. 6th: Patient had been very restless during the night, and was given morphia and atropine. Had to be catheterised. The dullness at the left back now reached to the level of the fifth rib, and the right border of cardiac dullness was slightly further out. Leucocyte count 2400. Was too ill for X ray examination. 7th: Temperature 104°, pulse 124–142, and respirations 40–48. Air hunger marked. Physical signs about the same. Exploratory puncture made in sixth left interspace in mid-axillary line and 10 c.c. of dark bloody fluid withdrawn. This contained many red blood cells and occasional leucocytes. No organisms found and a 24 hours' culture was negative. 8th: General condition seems better. Temperature 102°–103°, pulse 120, respirations 36. Not so restless. Chest examination (see Fig. 1): The right border of cardiac dullness was now 3½ inches from the middle of the sternum. Auscultatory findings markedly altered. On listening over an area covering the second and third right intercostal spaces close to the sternum a short systolic swish and a marked very rough diastolic bruit could be heard. A diastolic thrill could be palpated in the same area. These murmurs and thrill were definitely not present the day before. In Fig. 1 it will be seen that the cardiac dullness was of peculiar shape, in that it extended 2 inches from the middle line in the second right space. 9th: General condition the same. Air hunger constant. The thrills and murmurs could be heard and felt to the right of the sternum as before. To the left the heart sounds were barely audible. Polygraph tracings from the third and fifth right spaces confirmed this marked displacement of the heart. The one from the third right space was of left ventricle type, in that the wave was a positive one, while that from the fifth space far out was a negative wave, such as is caused by the right heart. The tracings from the root of the neck and the radial show no abnormality. The rhythm was not disturbed. Examination of the left chest showed dullness up to the fifth rib in front and behind. Aspiration was performed in the sixth space in the mid-axillary line and 26½ oz. of dark bloody fluid with some small soft clots were withdrawn. After aspiration the level of dullness in the

left chest lowered considerably, but the cardiac dullness only came in ½ inch. The murmurs and thrill could be heard and palpated with greater intensity than before to the right of the sternum. The notes for the remainder of the time ran as follows:—"11th: General condition shows a little improvement, but aspiration has not relieved air hunger and pulse is still fast. Temperature 100°–102°. Leucocyte count 20,000. Chest examination: Right heart 3½ inches from mid-sternal line. Heart murmurs have same character and position as before, but a swishing diastolic sound can be heard also on left side of sternum in fourth and fifth interspaces, and it is transmitted over towards left axilla and upwards along line of great vessels to right and left of sternum. The rough thrill can be felt in fourth interspace over an area about 2 inches in diameter and is almost localised to this area. There is still some dullness over lower left chest with distant sounds over the dull area. Above it the note is markedly hyper-resonant. 12th: The condition was unaltered except that the cardiac dullness was somewhat farther to the right. Patient depressed and incoherent at times. Murmur and thrill over right side of heart very intense. 14th: General condition of patient much worse. The right border of cardiac dullness 4 inches from middle line. Thrill can be felt in third, fourth, and fifth spaces; the diastolic murmur here very loud and rough. Dullness in left chest increased and now reaches behind to level of third rib. (Fluid evidently increasing in left pleura.)" The general condition gradually became worse and on June 16th the note ran:—"Condition worse. Temperature subnormal. Great depression. Air hunger constant. Pulse rapid and weak. Chest examination reveals no change except that right heart border is slightly further to right of mid-sternal line." The patient died during that night.

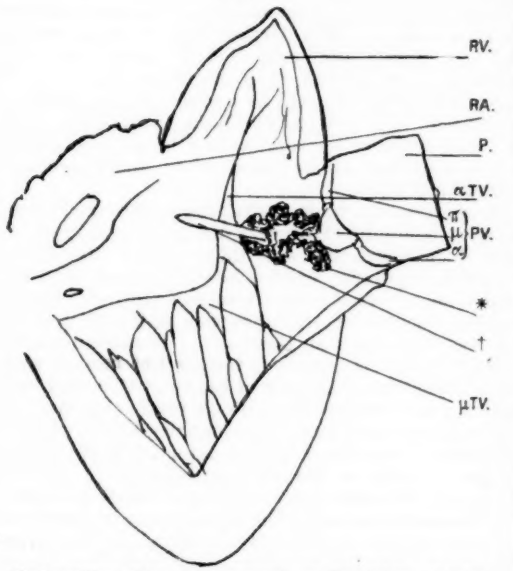
FIG. 1.



Right heart border, 3·5 inches to the right of the mid-sternal line. Position of wound marked in second left interspace. A, Area where diastolic bruit is heard. B, Absolute dullness on percussion except anteriorly. Breath sounds suppressed. Vocal resonance reduced. C, Area where systolic murmur is heard.

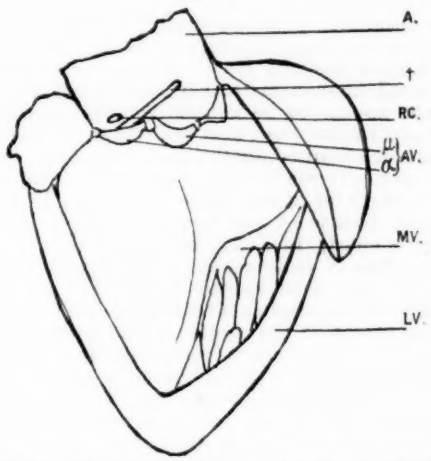
Post-mortem report.—"General emaciation. Chest.—Wound in the second interspace just below border of second left rib, and 3½ inches to left of mid-sternal line. There was a small amount of yellow pus in the wound. The wound did not open directly into the pleural cavity at time of autopsy. On opening the chest about two litres of dark bloody fluid were found in left pleural cavity. The left lung was pressed forward and was adherent to the anterior chest wall. Fibrous adhesions were present throughout the left pleural cavity. Also some partially organised clot. Lungs.—Right lung normal. Left lung: On section was found to be collapsed along the posterior portion, but was air-holding anteriorly and adherent to the chest wall. Towards the base of the lung was a moderately large area of consolidation with small abscess cavities containing pus. A fragment of shell or shrapnel-casing was found near the root of the lung and lying in a small cavity surrounded by pus. Heart.—Position in chest cavity: The apex of the heart was lying directly behind the sternum. The right border extended 4 inches to the right of the mid-sternal line. On opening the pericardium a considerable amount of yellowish fluid was found. The visceral and parietal layers were covered with fibrous deposit. A flattened mass of fibrin was lying free near the apex. This mass had the appearance of a partially resolved blood-clot. No wound in the walls of the pericardium was discovered. Left ventricle: No dilatation was present and the muscle appeared normal. Right ventricle: Cavity greatly dilated. On the inner wall an ulcerated patch was found extending anteriorly from near the medial and anterior leaflets of the tricuspid valve, and burrowing into the wall of the septum was a sinus which opened in the right ventricle near the base of the medial leaflet of the pulmonary valve. There were two openings of the abscess channel in

FIG. 2.



Cavity of the right ventricle exposed. RV, Everted flap of right ventricle; RA, right auricle; P, pulmonary aorta; TV, tricuspid valve: *a*, anterior; *m*, medial leaflet; PV, pulmonary semilunar valve: *a*, anterior; *m*, medial; *p*, posterior cusp; *, ulcerative area; †, point of probe projecting from the left heart along the abscess track.

FIG. 3.



Cavity of the left ventricle exposed. A, systemic aorta; RC, right coronary artery; AV, aortic valve: *a*, anterior, *m*, medial leaflet; MV, mitral valve; LV, left ventricle; †, point of probe projecting from the right heart along the abscess track.

the right ventricle and the area was covered with tags of fibrin which extended on to the tricuspid and semilunar valves. Burrowing directly through the septum the abscess channel opened into the systemic aorta under cover of the anterior leaflet of the aortic semilunar valve. The track connecting the aorta and the right ventricle was a little less than a quarter of an inch in diameter and there were irregular tags of fibrin at both openings. A thick probe passed readily from the aorta to the right ventricle. The right auricle was somewhat dilated. The liver was enlarged and congested. On section the congestion was marked about the central veins of the lobules, the condition being one of acute nutmeg liver."

The abscess in the heart was no doubt of metastatic origin from the wound in the left lung. A pericarditis was found post mortem, and yet no friction was noticed during life. Probably it was masked by the loud sounds of intracardial origin. The channel caused by the bursting of the abscess into the aorta and the right ventricle caused the unusual condition of aortic regurgitation into the right ventricle. The increased blood pressure thus produced in the right ventricle no doubt caused the great dilatation of that cavity. Evidently when the heart was in systole the aperture into the aorta would be effectually closed by the anterior leaflet of the aortic semilunar valve. When during diastole the semilunar valves closed, and they were apparently competent, a certain amount of blood would be forced into the right ventricle. The rough diastolic murmur heard over the right side of the heart and the thrill here were no doubt due to this regurgitation. The quieter systolic bruit that was present may have been caused by the presence of the exfoliations about the pulmonary semilunar valves, or indeed may have been of the ordinary "functional" type.

THE EXAMINATION OF THE SOLDIER'S HEART.

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THE discussion at the meeting of the Therapeutic Section of the Royal Society of Medicine held on Jan. 18th has induced me to record some observations based upon a method of investigation which does not appear to be generally recognised, or, if recognised in the past, may have been believed to possess such limited application as to have fallen into disuse. It seems that at the present moment it may prove of great value in determining the extent of disease of the myocardium in cases of "soldier's heart," in assisting in prognosis, and in the detection of malingering. (Malingering in my experience has been so rare as to make my reference to it rather academic than practical.)

The loudness of the cardiac sound depends upon so many factors that it would be erroneous to conclude that feeble sounds mean a feeble heart, because the tissues between the heart and the stethoscope may absorb much of the sound. The sounds of the heart of a stout man or of a man suffering from marked emphysema may be so feeble as to be difficult to hear, and in spite of this his circulation may be maintained in a normal manner, as shown by his pulse, his blood pressure, and his capacity for doing physical work. For this reason absolute measurements are of but little value. Comparative measurements do not suffer from the same error, because the two sides of the chest are usually of equal fatness, while localised emphysema is very rare in young subjects and not common in the old.

The normal ratio of intensities of the first sound at the apex to the second sound at the base is approximately 2 to 1; this has been established by many observers working with the stethoscopes of Oertel and of Bock. Experience has shown that this ratio is altered in cases of myocardial disease. Frequently the prognosis of a sudden cessation of heart beat has been made, based entirely upon the ratio being reversed, and this prognosis has proved only too correct. One must remember that there are many other methods of arriving at the conclusion that there is myocardial degeneration, and amongst the most reliable of these is the presence of the pulsus alternans. In quite a large number of cases, however, the ratio of intensity is altered before there is any tendency towards alternation in the strength of the beats of the heart. The estimation of the intensities of the two sounds by either of the instruments is an extremely simple matter, but since it is essential that there should be absolute quietness in the room in order to use Oertel's stethoscope with any accuracy, in hospitals and in many parts of London it is wiser to use the Bock stethoscope.

The principle upon which the Bock stethoscope acts depends upon diminishing the size of a hole in a thick diaphragm through which the sound must pass from the chest to the ears of the observer; the size of the hole is altered by screwing a cone-shaped piece of metal into it. The stethoscope is arranged to read 100 when the hole is completely closed, the face of the stethoscope is divided into 100 divisions; in order to use it the pointer is placed at 10, and then the stethoscope is applied over the apex of the heart, and the pointer slowly turned clockwise until the first sound can no longer be heard. The average position for this, when examining a normal individual, is about 80. This reading is made on several occasions and the average taken. The stethoscope is then placed over the aortic site; and is once more opened to the region of 10, and then gradually closed until the second sound cannot be heard. In the average individual this will occur about 45, and the ratio of intensity may be represented by 80 to 45. The instrument cannot be used when there are any cardiac murmurs.

Some time ago upon examining a man aged about 50, who complained of very little besides palpitation of the heart, and who did not have any œdema or any irregularity of the heart, I found that the ratio was reversed (that is to say, the intensity of the first sound at the apex was only half that of the second sound at the base). I communicated with his nearest relative, telling her that I took an extremely serious view of his condition, and that she should arrange her life as far as she could in the expectation that the patient would not survive very long. About two months later the patient died suddenly whilst in his office in the City. I refer to this case because it was one of the most dramatic, but time after time the instrument has allowed one to prophesy as to what will happen in the near future.

As a contrast to this, I record a case seen to-day. A man, 57 years of age, complained of extreme irregularity of the heart following upon an attack of influenza last September. A few days ago he told me this irregularity was so marked that he thought he was dying, and he sent for his medical

practitioner at 4 o'clock in the morning. Upon estimating the intensities of the sounds they were found to be normal—i.e., 80 to 40—and the tracing from his pulse showed that the heart frequently intermitted, but there was not the slightest suspicion of pulsus alternans. The patient admitted that his mental condition had much to do with his heart-beat, and on leaving fully made up his mind to carry out the treatment recommended—viz., to treat his heart with contempt.

One must not assume that myocardial degeneration is a condition from which recovery cannot take place. It is well known that in diphtheria the heart assumes a tick-tack rhythm, and the first and second sounds are approximately of equal intensity. It is not only in diphtheria, but if careful observation be made one will find that in scarlet fever, typhoid, measles, influenza, and quite a large number of infections in which toxins are produced which can affect the heart, the ratio of intensity is altered.

It is wise to attempt to prove every assertion, and therefore I quote a few cases.

1. A man aged 67. October, 1911: Chief symptoms, dyspepsia, strength failing, easily tired. Heart, no murmurs; ratio of sounds 60 : 60. Pulse regular, rather slow. B.P., 150. January, 1912: Ratio of sounds 60 : 60. July, 1912: Heart regular, does not miss at all; ratio 50 : 60. November, 1912: Pulse 72, regular. March, 1913: Developed pulsus alternans; ratio 50 : 60 Died six months later.

2. A woman, aged 25, unmarried. Dec. 4th: S.F. of four days' duration. No murmurs; ratio 60 : 50. Dec. 10th: Ratio 50 : 50. Dec. 18th: Ratio 60 : 45. Recovery.

3. A man, aged 54. May, 1913: Complained of occasional palpitation on exertion. Pain after food. Pulse regular, 75. B.P., 140 mm. Hg. Ratio 20 : 40. Sudden death three months later.

4. A man, aged 69. April, 1911: Breathless; œdema of legs; palpitation. Influenza two months previously. Ratio 50 : 45. July, 1911: Ratio 60 : 45. November, 1911: Ratio 65 : 40. Alive and well at present time.

5. A man, aged 67. Complained of palpitation. B.P., 145 mm. Hg. No murmurs; ratio 40 : 42. Severe pyorrhœa alveolaris; advised treatment of this condition. January, 1912: Ratio 45 : 45. B.P., 105 mm. Hg. March, 1912: Ratio 70 : 50. May, 1912: Palpitation has ceased; pulse quite regular. Ratio 75 : 50. February, 1913: Ratio 45 : 25. Alive and well at present day.

6. A woman, aged 60, unmarried. June, 1910: Normal ratio 80 : 40 November, 1912: Ratio had become 55 : 55. Died one year later.

7. A man aged 64. April, 1910: Complained of giddiness. No murmurs. Ratio 75 : 50. B.P., 160. April, 1911: B P. 135. Ratio 60 : 40. July, 1913: B P., 120. Ratio 60 : 45. December, 1914: Ratio 55 : 50. August, 1915: Ratio 50 : 50. October, 1915: Ratio 45 : 50. Death since.

The train of symptoms which is diagnosed as "soldier's heart" is sufficiently varied to have led some to believe that they arise from an increased secretion of the thyroid gland, others from physical strain, whilst yet others from a toxin due either to a microbe in the blood or to some infection in the past or to the inhalation of some poisonous gas. I venture to express the opinion that under the heading of "soldier's heart" all these conditions are included, and I believe that assistance in differentiating between these conditions would be afforded by a systematic examination of the intensities of the sounds.

My experience amongst soldiers is insufficient, but the few cases upon which opportunity for making observations has been afforded in private and at the London Hospital have led me to the conclusion mentioned above.

1. An officer, gassed May 7th, developed severe bronchitis lasting ten days, sent to England June 8th, and examined July 23rd. Felt sick and languid, heavy in head, easily tired when walking, breathless upon exertion. Ratio of first sound to second 60 to 55. Nov. 4th, was able to walk and run, felt very much better, and would have liked to return to his duties, but unfortunately had developed neuralgia. Ratio of intensity 75 to 50.

2. An officer. Fourteen days before examination he had a bad attack of indigestion, and was thought to be developing measles, was suffering from very marked nausea, and pain in the stomach. When examined on May 23rd stated that he felt he was quite unable to carry out his duties, got tired so rapidly, felt languid, occasional palpitations. Ratio of intensity of sounds, 40 to 45. Recommended leave for three weeks, during which time complete recovery occurred; this was apparently myocardial alteration due to ptomaine poisoning.

3. A private who had been gassed. The lungs cleared completely. Symptoms of "soldier's heart" persisted. Ratio remained 1 : 1. Invalided.

4. A private who had been gassed. The lungs cleared completely. Ratio persisted 1 : 1, and symptoms remained unchanged.

The cases presenting the symptoms of "soldier's heart" following explosions have not shown any evidence of disease of the heart, and I have considered them of nervous origin, and all that I can record about the sounds is that the ratio has always been 2 : 1, i.e., normal.

Portland-place, W.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Exhibition of Cases and Specimens.—Nephritis without Albuminuria.

A MEETING of this section was held on Jan. 28th, Dr. R. HUTCHISON, the President, being in the chair.

Dr. J. D. ROLLESTON (for Mr. SYDNEY STEPHENSON) showed a case of Dyspituitarism in a girl aged 15 years. She was taken to the ophthalmic department of the Queen's Hospital for Children with the complaint that the sight had been failing for three or four months, and that for one week she had suffered from headaches. Right vision, 5/5 J.1; left vision, 5/36 J.1; weak atropine drops were prescribed, to be used to each eye three times a day, and when the girl was examined the following week she was found to have in the right eye + 0·5 D. cyl., axis 180°, and in the left eye + 0·5 D. sph. A note was made to the effect that the media were clear. On August 27th, 1914, the sight of the right eye had become reduced from normal to "shadows," while that of the left eye remained as it was on admission some seven weeks before—namely, 5/36. The sight of the right eye was stated to have failed suddenly two weeks ago. The pupil of that eye had lost its direct response to light. The media were clear. Both optic discs were pale, but the retinal vessels were of normal dimensions. The girl was inclined to be stout and her eyes were rather prominent. For closer observation the patient was admitted to the hospital on August 27th, and remained until the following Oct. 24th. She was found to be a bright, intelligent, and good-natured girl, whose every movement appeared to be normal. There was no tremor or alteration in sensation. The facial movements were normal, and there was no nystagmus. The functions of all the cranial nerves, with the exception of the second, were normal. During her stay in hospital there were occasional headaches, but no vomiting or vertigo. Successive weights during the two months' stay in hospital were: 79 lb., 79 lb., 79 lb. 10 oz., 81 lb., 80 lb. 4 oz., 80 lb. 8 oz., 80 lb., and 74 lb. 4 oz. The temperature was usually between 98° and 99° F.; but on 13 occasions during her sojourn in hospital it rose to between 99° and 100°. An examination of the blood, conducted a few days after admission, gave the following results: Red blood corpuscles, 3,770,000; white blood corpuscles, 6400; hæmoglobin, 65 per cent.; index, 0·86. The differential count was: Neutrophiles, 55; basophiles, 1; eosinophiles, 2; large lymphocytes, 9; small lymphocytes, 29; hyaline, 4; total, 100.

The knee-jerks were brisk; there was slight ankle-clonus. Flexor plantar response. The abdominal reflexes were present; the reflexes of the upper arm were easily elicited. No jaw-jerk. No facial irritability. The Wassermann reaction was negative as regards both the blood serum and the cerebro-spinal fluid. There was no increase of pressure in the cerebro-spinal fluid, which from other points of view was normal. The sphenoidal and other sinuses were reported as normal. The girl was next seen on May 13th, 1915, when sight remained much as it had been on the date of the last note. The optic discs were pale, with no evidences of antecedent neuritis. The retinal vessels were of good size. The field of vision of the right eye could not be taken, but that of the left eye, estimated for a small white object, was restricted in the temporal region, although tolerably full elsewhere. On June 17th no pubic hair was present. She was placed on thyroid, 1 gr. twice a day. A negative report was received at about this time respecting an X-ray examination of the patient's skull. Sept. 9th: Right vision, perception of light; left vision, 3/60. Dose of thyroid increased to 4 gr. a day. Oct. 7th: Left vision, 3/60, No. 20 J. Dec. 4th: Although within a few weeks of 15 years of age, no signs of menstruation have appeared. No headache, vomiting, or vertigo. Pupils 6·5 mm. in diameter. Direct action of the right eye almost lost, while that of the left one is as yet almost intact. A very slow hippus is present. The optic discs are pallid, well-defined, and the physiological cups are not filled in or concealed in any way. Retinal vessels of good size. The visual field of the left eye, as tested for 10 mm. white square, is entirely confined to the nasal half. The fixation point is as yet intact. Right vision, ? perception of light; left vision, 1/24 (letters) and No. 18 J. (letters). A report from Mr. E. U. Williams, radiographer to the Queen's Hospital, states: "The sella turcica is greatly enlarged, the antero-posterior diameter being 17 mm. There appears also to be some thinning of the clinoid processes."

Dr. T. R. C. WHIPHAM showed two cases of Hypertrophic Cirrhosis of the Liver. 1. A boy, aged 9 years, was taken to hospital on Nov. 24th, 1915, with a history of jaundice during the previous three weeks. He vomited at the onset of the jaundice, but had no further nausea until just before he was seen. For the same time he had been getting thinner and had lost his appetite and spirits. The urine had been dark-coloured and the motions light, "like putty." There was one younger brother in the family, who was healthy, and between him and the patient the mother had had one miscarriage. When first seen the boy was well nourished and presented a general icterus of moderate severity. There was no irritation of the skin, and the pulse was not diminished in frequency. The liver was greatly enlarged, extending to within 1¼ in. from the umbilicus, and was firm and uniform to the touch. There was no enlargement of the spleen or of the lymphatic glands. The thoracic viscera were normal. A blood count showed: red corpuscles 4,500,000, white cells 6000 per cubic millimetre; the hæmoglobin value was 100 per cent. The urine contained much bile-pigment, and the bowels were constipated. The Wassermann reaction was negative. Treatment with calomel and salines brought about a gradual diminution in the jaundice, and at the present time no colouration was visible. The liver, however, remained approximately the same size. 2. A boy, aged 6 years, attended hospital on Jan. 10th, 1916, on account of jaundice of 10 days' duration. He was said to have been getting thinner and to have lost his appetite. He had had no pain, but had vomited once on Jan. 9th. The urine had been of a dark colour, but, according to the mother's definite statement, bile had never been entirely absent from the stools. The patient had one brother who was healthy, and there had been no miscarriage. The boy showed a marked icterus of a deep yellow colour, rather more intense than that in the preceding case. He had no itching of the skin and the pulse was not slow. The liver was very similar to that of the first case, but was a trifle larger in proportion, the lower edge being felt within ¾ in. from the umbilicus. In this case also there was no enlargement of the spleen nor of the lymphatic glands, nor any abnormality in the thoracic organs. The blood count likewise resembled that in the former case, the red corpuscles numbering 4,500,000 and the leucocytes 10 000 per cubic millimetre, while the hæmoglobin value was also 100 per cent. The urine was deeply pigmented with bile, but the fæces have not been observed. The Wassermann reaction was negative. The patient had been treated with calomel, but the deep jaundice still persisted and the liver had not altered in size.

Dr. J. L. BUNCH showed: 1. A case of Papillomatous Growths in an old operation scar. The patient, a boy aged 13 years, was operated on eight years ago for a fatty tumour on the left side of the chest. Some months after the scar had healed small reddish growths began to appear on and around the scar, and such growths have recurred intermittently ever since. There were now about a dozen of these growths which were soft, sessile, and red to purplish in tint. Under the microscope they had a definite papillomatous character with a well-marked cortex. No tubercle bacilli had been found in them, and von Pirquet's reaction was negative. There was nothing abnormal in the lungs. 2. A case of Multiple Tumours of Molluscum Contagiosum. The patient, a girl aged 13 years, had a number of typical molluscum contagiosum tumours on both arms. One or two had undergone degeneration. They had been present about a month. 3. A case of Chronic Patchy Dermatitis. The patient, a girl aged 11 months, had a number of scattered erythematous patches on the trunk and thighs. These patches appeared soon after birth, the first one being on the side of the neck, and had gradually increased in numbers. No patch which had once made its appearance disappeared again, but after some weeks or months it developed a yellow tint which persisted. No patch was definitely scaly, but some of the earliest ones showed a slight roughness of the skin, the recent patches being quite smooth.

Dr. C. O. HAWTHORNE showed: 1. A case of Double Optic Neuritis in a girl aged 7 years. She enjoyed good health until Christmas, when she vomited on two or three occasions in the early morning and before breakfast; there was also some complaint of headache, but she was never regarded by her mother as in any sense seriously ill. As the vomiting was repeated on several occasions the doctor advised admission to hospital. She was bright and cheerful, and made little or no complaint; double optic neuritis was marked, but there was no other evidence of nervous disease, though a degree of alternating convergent squint; vision 6/6 each eye. Cerebro-spinal fluid negative; Wassermann test (?). No evidence of visceral disease. 2. A case of Solid Œdema. The patient, a girl aged 15 years, six years ago fell and cut her left leg below the knee; the limb became red and inflamed and she was confined to bed for a month. Two years later the limb was noticed to be swollen, and this condition had persisted, or even increased, to the present date. There was pitting on pressure over the dorsum of the left foot, and the soft tissues of the left leg and of the lower thigh were thickened but without evidence of dropsy. The left calf had a circumference greater than the right by 2½ in., while 5 in. above the upper border of the patella the left thigh measured 19½ in., and the right 16¼ in. The limbs were of equal length, and skiagrams showed nothing abnormal in the left tibia or fibula.

Dr. H. THURSFIELD showed a Cardiac Case for Prognosis. The patient, a girl aged 13 years, had had four attacks of chorea: the first in 1912, the last in May, 1915. She now had her cardiac impulse 1 inch outside the left nipple line with some dilatation of the right side, and systolic and early diastolic murmurs. The chief feature of the case, however, was the pulse irregularity, which varied considerably, but was, according to the electrocardiogram, due to ectopic contractions of the right ventricle. The cardiac affection did not seem to have checked her growth. She now weighed 7 st. 11 lb. in her clothes, and was unusually muscular and big for her age.

Dr. E. CAUTLEY showed a case of Tumours over the Manubrium and in the Left Calf in a male infant aged 15 months, whose mother had died 12 months ago from tuberculosis.

Dr. E. C. WILLIAMS exhibited a specimen of a Heart showing Infiltration by Large Round-celled Sarcoma, probably originating in the sternal periosteum, from a boy aged 8 years, with a history of eight weeks' illness, with pain in the left side, cough, cyanosis, and orthopnœa. There was an increased area of cardiac dullness, the apex beat was diffused, the sounds were muffled, there was no distinct murmur; later there was friction heard over the sternum, also pleural friction on the left side. Post mortem the anterior mediastinum was filled

with a white hard growth adherent to the sternum, invading the visceral and parietal layers of the pericardium, rendering them indistinguishable and encasing the heart in a bony hard pericardium. The heart muscle was also invaded. Section of the growth by Professor I. Walker Hall showed it to be a large round-celled sarcoma.

Dr. ERIC PRITCHARD showed a specimen of Congenital Double Hydro-ureter. Both ureters were greatly enlarged, with double hydronephrosis; at the necropsy they were found to be full of thickly purulent urine. The kidney substance was reduced to a shell, and the ureteral openings of the ureters into the bladder were greatly stenosed. The bladder was enlarged and the walls hypertrophied; the urethral orifice appeared normal. The patient, a girl aged 12 years, was admitted to the Queen's Hospital for incontinence of urine and ingravescent drowsiness. She appeared to have had good health till within a year of admission, when symptoms of incontinence commenced. Four days before admission pus was discovered in the urine with albuminuria, and the patient complained of a sensation of cold down the back. On admission the child was in a comatose condition and breathing was slightly stertorous. There was a large, rounded swelling in the abdomen, which extended to the umbilicus. She had a strong smell of urine and incontinence was continuous. The temperature was normal, the pulse and respirations regular; the blood tension was 125 mm. Hg. The fundi were normal. The urine contained a large amount of pus, with a large number of staphylococci and a few coli bacilli. The uræmic symptoms gradually increased, and the child died four days after admission.

Dr. J. PORTER PARKINSON read a short paper on Nephritis without Albuminuria following pneumonia in a boy aged 3½ years.

SECTION OF DERMATOLOGY.

Exhibition of Cases.

A MEETING of this section was held on Jan. 20th, Dr. J. H. STOWERS, the President, being in the chair.

Mr. J. E. R. MCDONAGH and Dr. H. SPENCE showed three cases of syphilis treated by "intramine."[1] 1. Chronic Ulcerative Glossitis of 25 years' standing, which had resisted treatment with salvarsan, mercury, and iodides, and which healed in a fortnight after one intramuscular injection of intramine. 2. Gummatous Ulceration of the Genitals in a congenital syphilitic (male) aged 28. The ulcers healed with one injection of intramine, and the general condition was greatly improved. 3. Recurrent Papulo-ulcerative Syphilide in a man aged 42, which healed in a week with one injection of intramine. Mr. McDonagh stated that as a result of his experiments he found that salvarsan did not attack the syphilitic organisms directly, but that it became attached to the lipoid-globulin molecules of the serum, which by the chemico-physical action of adsorption killed the parasites. For this chemico-physical action to take place active oxygen was necessary. Active oxygen was normally formed directly by peroxidases and indirectly by perhydridases. The arsenic in the salvarsan molecule, in the form of a hydroxide, acted as a peroxidase. Mr. McDonagh stated that metals acted as peroxidases, and that from experiments he had made with aluminium and iron he had prepared drugs which acted better than arsenic and which were absolutely non-toxic. Cases would be shown illustrating the therapeutic effects of these new compounds shortly. Mr. McDonagh found that in early syphilis oxidation was more to the fore than reduction and that the opposite was the case in late syphilis, therefore he had endeavoured to find out how the reducase system worked and to make a drug which had the same action therein as aluminium, iron, and arsenic had in the oxidase system. He found that the perhydridase was a di-sulphide protein and that sulphur, a non-metal, was the catalyst. Having prepared many sulphur compounds, he found that the di-ortho-amino-thio-benzene or "intramine" had the greatest therapeutic effect. Intramine proved to be in many respects more efficacious than salvarsan, and to be absolutely non-toxic.

Dr. E. G. GRAHAM LITTLE showed: 1. A case of Extensive Tinea contracted in West Africa. The patient was a soldier who developed the disease in September last. The tinea began in the groin and spread to various parts of the body, but it never attacked hair. The fungus was the epidermophytum inguinale of Sabouraud. 2. A case of Chronic Ulceration exhibited first in October, 1915, and previously reported. Success had recently been made in obtaining a coliform organism from the blood, and from an early bulla. Under vaccine treatment with this organism the patient rapidly recovered.—Dr. J. J. PRINGLE stated that he had had some cases of bullous dermatitis, which had improved with vaccines of coliform bacilli.—Dr. A. DOUGLAS HEATH had had a case similar to the exhibitor's from which coliform bacilli had been isolated. Vaccine treatment improved the condition.

Dr F. PARKES WEBER: A case of Kaposi's so-called Idiopathic Multiple Pigmentary Sarcoma. This case had improved without treatment since it was shown first in April, 1905.—Dr. J. H. SEQUEIRA and Mr. J. P. BEDDOES reported cases which had run on for years with steady improvement, and other speakers were generally of the opinion that the disease was not fatal.

Captain GORDON WARD, R.A.M.C., showed a case of Recurrent Papular Syphilide of 16 years' duration, which had not been treated with antisyphilitic remedies.

Dr. S. E. DORE showed a case for diagnosis. The patient had just left a hospital in Rouen, where he had developed with seven others a skin condition on the extremities like a streptococcic impetigo.—Dr. A. EDDOWES thought it was a septic dermatitis, and that the organisms had probably entered the system through a fissure between the toes.

Dr. SEQUEIRA showed: 1. A case of Sclerodermia with Graves's disease. The patient was a woman, aged 22, who was suffering from Graves's disease, during the course of which sclerodermia of the morphœic "spot" type appeared on the chest, arms, and between the shoulders.—Dr. R. M. TRAVERS-SMITH related the case of a whole family which showed the relationship between Graves's disease and sclerodermia.—2. A case of Molluscum Fibrosum with other Congenital Abnormalities. The patient was a man, aged 21, who exhibited kyphosis and had congenital heart disease. The left eyeball had been removed for a condition of buphthalmos, and now overhanging the orbit was a large soft pedunculated tumour. The patient had various molluscum fibrosum tumours scattered about the body.—Dr. PARKES WEBER suggested that the tumours were plexiform neuromata, and that in view of certain pigment spots on the trunk he thought the case was one of von Recklinghausen's disease.

[1] THE LANCET, Jan. 29th, 1916, p. 236.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

Exhibition of Case.—Infantile Tetany.—The Lower Uterine Segment.

A MEETING of this section was held on Dec. 17th, 1915, Dr. GIBBON FITZGIBBON, the President, being in the chair.

Dr. E. HASTINGS TWEEDY showed a case where he had resected both suppurating tubes for the cure of sterility and inserted a piece of No. 1 chromicised catgut in the lumen.—Sir WILLIAM SMYLY said that the tubes appeared to be tuberculous. If that were so, it showed that pelvic tuberculosis was a very localised and chronic condition.—Mr. SPENCER SHEILL suggested a further improvement in technique by passing a double thread of fine catgut through the tube by means of a forked probe, splitting the stump of the tube and suturing each flap together with one of the ends of gut to each side of the ovary so as to embrace it. He considered a false passage made in passing the gut as of little importance.—Dr. M. J. GIBSON stated that his difficulty in these cases was to get the chromicised catgut to pass along through the lumen of the tube without making a false passage.

Mr. SHEILL read a paper on Infantile Tetany.—Dr. ELLA WEBB suggested that the cases described appeared to resemble convulsions from causes either of a toxic or irritative nature. Could cases with slight tonic spasm, occasional flexion of the forearm or thigh, increased by pressure, be correctly named tetany? The condition, as described in the text-books, took an intermediate place between definite convulsions and these slight spasmodic

contractions. Dr. Webb had been unable to find any connexion between the parathyroid bodies and the digestive causes of tetany universally recognised.—Mr. SHEILL, in reply, defined tetany as spasms of the face and limbs without loss of consciousness. He considered tetany to be a mere symptom of some ailment and to be a stage less than true convulsions, and a stage worse than simple spasms. In answer to Dr. R. D. PUREFOY, he said that tetany in adults was not common, as hysteria accounted for so many supposed cases.

Dr. TWEEDY read a paper on the Origin and Boundaries of the Lower Uterine Segment. He claimed that there were now sufficient data available to clear up the mystery in connexion with this anatomical structure. The endoperitoneal tissue forms the true boundary between the cervix and body and constitutes the tendinous extremities of the uterine fibres. Until this tissue has been put out of action, either by rupture or by opening of the os internum, there can be no pressure exerted on the cervix. He showed that the dilatation of the internal os was an early phenomenon of pregnancy, and that this dilatation permitted the ovum to pass through and press directly on the cervix. Continuous pressure on the cervix caused a rapid hypertrophy, and this law obtains in the unimpregnated as well as in the pregnated uterus. The cervix does not stretch but rather grows, and the growth of the lower uterine segment has its complete counterpart in the growth of the supravaginal portion of the non-impregnated procidentia uteri.—Sir WILLIAM SMYLY said that most of the ideas in the paper, although new to him, appeared to conform to the established facts.—Mr. J. S. ASHE stated that in his experience the opening of the pelvic fascia was more rigid than was usually imagined. The uterus fitted into this as a hanging hinge. He considered the elongation of the cervix due to the driving down of the uterus through this opening.—Dr. F. W. KIDD asked how Dr. TWEEDY would reconcile one or two practical points with his theory: 1. In cases of elderly primiparæ, if hypertrophy of the cervical zone took place instead of elastic distension, why was there more tedious dilatation in elderly than in young primiparæ? 2. In cases of rigid os, where the cervical zone was so thinned out that it was difficult to state the position of the os, how was this to be reconciled with hypertrophy of the cervical zone? 3. When premature rupture of membranes occurred labour tended to be prolonged in the first stage because the hydrostatic dilatation was lost. Did not this point rather to an elastic distension than a hypertrophy?—Mr. SHEILL queried if growth, due to sustained pressure, could account for hypertrophied cervix in virgins following increased abdominal pressure from tight lacing and constipation.—Dr. GIBSON said that the supravaginal portion of the cervix adapted itself to pregnancy just as the body does. The growth of the cervix began, however, long before labour commenced. It could be recognised after artificial dilatation of the cervix during the seventh month.—The PRESIDENT said that the original controversy over Bandl's and Müller's rings was still undecided. Dr. Tweedy had supported Bandl's view, and the explanation which he had offered for the formation of the lower uterine segment out of the upper dilated portion of the cervix seemed to be what was required to give preponderance to the one theory over the other.—Dr. PUREFOY also spoke, and Dr. TWEEDY replied.

CENTENARIANS.—Mrs. Elizabeth Clemens, of York-street, Plymouth, who celebrated the 100th anniversary of her birthday last July, died on Jan. 18th.—Mrs. Ann Knight celebrated the 105th anniversary of her birthday at Dundee on Jan. 28th.

DONATIONS AND BEQUESTS.—The residue of the estate of the late Mrs. Rebecca Thorne, amounting to about £12,000, will be divided equally between St. Mary's Hospital, the West London Hospital, and the Central London Ophthalmic Hospital.—By the will of the late Mrs. Mary E. Williams, of Holme Island, Grange-over-Sands, Lancashire, the testatrix bequeathed certain lands as a site for a convalescent home for Westmorland, and further estate to form an endowment fund. The testatrix also left £200 to the County Hospital, Kendal, and £100 to the Meathop Sanatorium for Consumption.

Reviews and Notices of Books.

A Manual of Surgical Anatomy.

By LEWIS BEESLY and T. B. JOHNSTON. London: Henry Frowde and Hodder and Stoughton. 1916. Pp. 557. Price 12*s.* 6*d.* net.

THE teaching of surgical anatomy is fraught with difficulty, both as regards its manner, its period in the curriculum, and what should and should not be included. It is highly desirable for the student who is learning anatomy to appreciate the points which have practical bearing on the subjects of clinical medicine and surgery. Far too often he approaches the study of anatomy as a dreary subject which the authorities have decided must be learnt and in which an examination must be passed before he is allowed to handle human patients, with the natural result that after passing the examination the subject is rapidly forgotten. For this attitude of mind the student can indeed hardly be blamed, for he learns what he believes will be most useful for the examination without regard for the future. In the whole domain of science the country is now finding that better education has become a necessity, and the need is pressing of a more useful method of teaching anatomy and the other ancillary elementary subjects, especially in regard to their application to medicine and surgery.

The manual of surgical anatomy before us makes an attempt to lift the subject out of the well-worn grooves, and to provide a rational description of the anatomy of each region of the body, together with a general idea of the diseases which may have to be dealt with. The work has been founded on a series of lectures on surgical anatomy delivered in connexion with the Edinburgh post-graduate course. Besides the descriptive anatomy, it contains an element of embryology, especially in connexion with the bones, as well as a considerable amount of operative surgery and much general surgery. It is manifestly difficult to present anatomy in a form suitable for the dissecting-room, while giving also within a reasonable compass a survey of anatomy in its surgical application. This can only be done by judicious omission on the one hand and expansion on the other, and this book contains a great deal of useful information which is not easily available in any text-book on anatomy or on surgery. It gives, for instance, excellent indications on the method of surgical approach to the various joints, how they may be exposed and how drained. Dislocation and fracture with resulting deformities are outlined and the conditions made clear by skiagrams. These instances could easily be multiplied, and indicate that surgical anatomy can be considered and taught in a more useful manner than it has been in the past. We commend this manual highly.

Fractures and Dislocations.

BY MILLER E. PRESTON, A.B., M.D., Surgical Examiner, Colorado State Board of Medical Examiners. With a chapter on Röntgenology by J. G. STOVER, M.D., Professor of Röntgenology, School of Medicine, University of Colorado. With 860 illustrations. London: Henry Kimpton. Pp. 813. Price 31*s.* 6*d.*

THE author in his preface states that the object of his book is to offer the reader in a few words a working knowledge of the subject of fractures and dislocations, whilst avoiding as far as possible all theories and arguments void of practical value for

the surgeon. He endeavours by means of copious photographs and illustrations to enable his readers to see the various deformities as they appear immediately after the occurrence of the injury, and this graphic method of teaching takes the place of lengthy descriptions in the text. The old classification of fractures under one heading and dislocations under another has been abandoned, and a method substituted, as being more practical, of considering the injuries according to the region in which they occur. The author is to be congratulated on a work which contains the most recent information and which presents it in a form that many will find to be highly convenient. The treatment of fractures by operation is well described, and if the question of operative interference in simple fractures is not very seriously faced, the contribution is nevertheless a valuable one. The subject of bone transplantation, which is likely to continue to attract attention, is fully discussed. Among the copious illustrations many are so poor as not to merit insertion.

LIBRARY TABLE.

The Order of the Hospital of St. John of Jerusalem and its Grand Priory of England. By H. W. FINCHAM. London: W. H. and L. Collingridge. Pp. 88. Price 6*s.* net.—The Sovereign Order of Hospitallers, the earliest Order of Chivalry, consisting of military monks of four nationalities, carried on the work of hospitality and healing first at Jerusalem and then in turn at Acre, Cyprus, Rhodes, and Malta. The reader is brought into contact with pilgrims, crusaders, and the leaders in the mediæval struggle with the Turks in Western Europe. The history of the Order is traced through a gradual decline until the dispersion of the Knights by Napoleon. The portion dealing with the Order in England shows how an organisation grew up in direct connexion with the English "langue" in the Mediterranean. Starting in Clerkenwell it spread to various parts of England and also to Scotland and Ireland, absorbing the later Order of Chivalry, the Templars. Dissolved by Henry VIII. and revived for a short time by Queen Mary, it was again revived during last century as a voluntary Order, and became an official Order in 1888 by charter from Queen Victoria. In an interesting chapter the secretary of the Order, Mr. W. R. Edwards, shows how the early humanitarian spirit has worked out in the formation of the St. John Ambulance Association and Brigade respectively for instruction in, and practice of, first-aid and nursing. The story is told of the relief of suffering in civil and industrial life, and the important part which the Brigade played in the help of the wounded in the South African War, and is playing in the present conflict. The opening, in 1881, of the British Ophthalmic Hospital at Jerusalem, a unique institution, now temporarily abandoned, recalls the establishment there of the first hospital of the Order 900 years before.

Of the Grand Priory Buildings, little remains in the general structure, but the author has industriously collected all the known facts and records them in picture or plan, giving details of everything down to the fish pond. The Gate House, now known as St. John's Arch, built by Grand Prior Sir Thomas Docwra shortly before the dissolution of the Priory, is described, and the archives of the Order which are contained there with some relics of the Malta occupation, including examples of the coinage. The staircases and panelling are particularly noteworthy, and the new Chapter Hall is in keeping with the older portions. In the Chancery is a fine Elizabethan chimney-piece, which was formerly in "The Baptist's Head," at St. John's-lane. The chequered history of the Gate House after the Dissolution is recorded, together with its association with Dr. Johnson. The author's introduction to the Priory Chapel, now the Parish Church, has led to 25 years of research during his churchwardenship, and the result is a book full of interest and very creditable to the writer as an antiquarian. Fifty excellent plates and plans, many of them from the author's own photographs, embellish the pages.

The Molecular Volumes of Liquid Chemical Compounds, from the Point of View of Kopp. By GERVAISE LE BAS, B.Sc. Lond. With diagrams. London: Longmans, Green, and Co. 1915. Pp. 271. Price 7*s.* 6*d.* net.—The question of molecular structure is of interest to medical science, as its study in recent years has resulted in placing treatment by various chemical combinations on a less empirical basis than before. The complicated organic arsenic compounds used in syphilis are a case in point. That the study of these questions is beset with difficulties is admitted by the author of this book, who has given considerable time and attention to the theory of molecular volumes and the application of the views of Kopp to the constitution of organic compounds. It is a long time ago now that Herman Kopp attempted to trace a connexion between the specific gravity of elements and compounds and their atomic composition. He succeeded in discovering a number of relations, and thought that he had established a law governing these relations. Later investigations have shown, however, that the law is only approximately true. It was to the effect that the molecular volume of a compound is equal to the sum of the atomic volumes of its constituent elements. The molecular or specific volume is the quotient obtained from the molecular weight and the specific gravity of a liquid at its boiling point. Since Kopp's work was published a number of additional data have been obtained, and the story of this further development is well told in the book before us. Mr. Le Bas's work, which represents some eight years of preparation, should be of material help to those interested in advancing an important branch of study.

Occupation Therapy: a Manual for Nurses. By WILLIAM RUSH DUNTON, jun., B.S., M.A., M.D., Instructor in Psychiatry, Johns Hopkins University. Illustrated. London and Philadelphia: W. B. Saunders Company. 1915. Pp. 240. Price 6*s.* 6*d.* net. —This little book is stated in the preface to be the outgrowth of a series of talks given to hospital nurses, although the author has kept constantly in mind the nurse in charge of a private case who is responsible for the occupation of her patient without having anyone to help her who can advise her as to the best method. The first four chapters deal with the history of "occupation therapy," hobbies and their value, the psychology of occupation, and the mechanism of recovery by occupation. The remainder of the book is divided up into a number of short chapters, dealing one by one with 20 or more types of occupation, from puzzles and catches, through card games, string-work and weaving, to gardening and nature-study. The several sections, though necessarily short, are suggestive, and give references for further study in any desired direction. There is a useful bibliography and index, and the nurse who desires suggestions for occupying the patient will get the help she needs.

CLINICAL REPORT ON THE APPLICATIONS OF EUSOL.

REPORT TO THE MEDICAL RESEARCH COMMITTEE.

IN response to a request from the National Insurance Medical Research Committee an investigation on the use of antiseptics was undertaken in the Department of Pathology in the University of Edinburgh in January, 1915. A paper embodying the experimental and clinical results of the investigation was published in the *British Medical Journal* by Professor J. Lorrain Smith, Dr. A. Murray Drennan, Dr. Theodore Rettie, and Dr. W. Campbell on July 24th, 1915.

Comparison of different types of antiseptics led to a general conclusion that hypochlorous acid is of the highest value in the treatment of septic wounds. At the date of the publication in July a considerable amount of surgical experience on the subject had already accumulated, and it was felt that extended clinical investigation was called for. This was determined on at a meeting of surgeons summoned by the President of the Royal College of Surgeons, Edinburgh, and held on August 10th. On the motion of Surgeon-General G. D. Bourke, C.B., D.D.M.S., seconded by Professor Harvey Littlejohn, Dean of the Medical Faculty, the meeting appointed the following committee to prepare a report:—Major James Hodsdon, President of the Royal College of Surgeons, Edinburgh (chairman); Lieutenant-Colonel F. M. Caird, Vice-President of the Royal College of Surgeons, Edinburgh, Professor of Clinical Surgery, University of Edinburgh; Lieutenant-Colonel J. M. Cotterill, senior surgeon, 2nd Scottish Military Hospital, Craigleith; Lieutenant-Colonel C. W. Cathcart, senior surgeon, Edinburgh War Hospital, Bangour; Major David Wallace, Red Cross Commissioner, Eastern Division of Scotland; Captain H. J. Stiles, surgeon to Edinburgh War Hospital, Bangour; Dr. A. H. F. Barbour, President of the Royal College of Physicians, Edinburgh; Dr. Graham Brown, curator of the Royal College of Physicians Laboratory, Edinburgh; Dr. J. Lorrain Smith, Professor of Pathology, University of Edinburgh; Dr. James Ritchie, Professor of Bacteriology, University of Edinburgh. Secretaries: Dr. A. Murray Drennan, Professor of Clinical Pathology, University of Otago, N.Z.; and Dr. Theodore Rettie, research assistant under Medical Research Committee.

The present report is based on experience extending over the last 10 months. Eusol was first used by Captain W. J. Stuart in the Deaconess Hospital on March 4th, 1915. He reports as follows: "The cases on which it was used were the ordinary very septic bone and other wounds which are found in a Military Base Hospital. Its success was so immediate that it displaced all other antiseptics in the treatment of these cases in this hospital." The following report includes a number of records of military and civil cases which have been collected since that date. The preparations of hypochlorous acid which have been applied are those described in the paper published in July and recommended after an extended experimental investigation.

Solutions of alkaline hypochlorites have long been employed as antiseptics; on the other hand, solutions of hypochlorous acid have not been generally employed. There is evidence, however, that chlorine water owes its antiseptic power to the presence of hypochlorous acid in solution, and in this connexion it is interesting to refer to a case treated by Lister in which he found the liquor chlori of the old British Pharmacopœia an effective antiseptic when a 1 in 5 spirit solution of carbolic acid had failed.[1]

The intense germicidal power of hypochlorous acid solution was demonstrated in 1903 by Andrewes and Orton,[2] but they did not devise a method of preparing a solution suitable for surgical practice. While, therefore, the antiseptic power of hypochlorous acid has been known for a long time its practical value has not been fully appreciated. The difficulties encountered in the treatment of sepsis in the present war led to the investigations which have proved that hypochlorous acid can be applied to an extent hitherto unsuspected. This general conclusion is confirmed by observers who have worked with dilute solutions of sodium hypochlorite.[3]

The cases recorded in the report have been placed under two headings, civil and military. Of the civil cases 99 were treated in hospital and 100 in the out-patient department. They include various types of septic lesions the details of which have been summarised in Table A. The military cases have been selected for the purpose of showing the applicability of the method to the treatment of wounds both recent and those in which sepsis had been established for at least a week and in some cases for months. (Table B.)

Surgical Out-patient Department, Royal Infirmary: Mr. J. M. Graham and Mr. Jardine.

One hundred cases were treated. These consisted of lacerated and contused wounds, cuts, septic ulcers, abscesses, whitlow, &c. Of these, 67 never showed sepsis; 23 were septic when they were admitted to the department; 10 became septic after treatment, but experience showed that the cause of this was insufficiency in the application of eusol—e.g., one dry dressing in 24 to 72 hours.

Special note was made of 10 cases in which an experimental first field dressing was applied with the view of testing its power of preventing sepsis. It consisted of a pad of gauze in the centre of which were placed 2 grammes of dry eupad. The powder was moistened by fluid discharge from the wound or where the wound was dry a little water was poured on the dressing. It was covered only by the bandage. The purpose was to test the disinfecting power of the hypochlorous acid gas given off from the moistened eupad. This treatment was completely successful except in 3 cases. In one of these the patient returned after 24 hours, when the wound was found clean and a eusol dry dressing was applied. The patient then absented himself for seven days, and at the end of this period he returned with the wound septic. In the second case, a contusion of the scalp in a child 5 years of age, the wound remained clean for three days. It was then being treated with a dry dressing of eusol; this was insufficient to prevent the onset of sepsis, but it was cured by eusol soaks. In the third case the wound became infected because the patient removed the dressing.

This subject deserves further investigation, but it can be adequately dealt with only in the field—for example, by the regimental medical staff or the field ambulance medical officers.

[1] Remarks on a Case of Compound Dislocation of the Ankle, 1870 Collected Papers, vol. ii., p. 155.

[2] Cent. f. Bakt., 1903-4.

[3] Dakin: Brit. Med. Jour., August 28th, 1915. Bowlby: Ibid. Dec. 25th, 1915.

TABLE A.—CIVIL CASES.

No.	Disease.	Surgeon and hospital.	Mode of application.	Frequency of application.	Result.
1	Large varicose ulcer; weak granulations, copious discharge.	Major Hodsdon, Royal Infirmary, Edinburgh.	Wet, then dry dressing.	1 per day.	Showed marked improvement in 24 hours. Completely healed in 39 days.
2	Varicose ulcer; slight discharge, no tendency to heal.	Major Hodsdon and Mr. Wood.	Eupad in gauze, once dry dressing, then wet dressing.	,, ,,	Ulcer completely crusted over. Completely healed in 5 days, but broke down later.
3	Varicose ulcer; slight thick discharge.	Col. Thomson, Royal Infirmary, Edinburgh.	Dry dressing.	,, ,,	Healed steadily.
4	Varicose ulcer; free discharge.	Surgeon, Outpatient Department, Chalmers' Hospital.	Soak and eupad.	,, ,,	Great improvement.
5	Carcinoma of rectum; operation.	Major Hodsdon and Mr. Wood, Royal Infirmary, Edinburgh.	Eupad and eusol syringed.	1 per day; begun on 3rd day.	Discharge practically ceased in 1 month.
6	,, ,,	Capt. Stiles, Chalmers Hospital.	Eusol, quarter strength, syringed.	—	Healed by first intention.
7	Laceration extending from groin to knee inner side of thigh (accident); vessels exposed.	Capt. Miles, Royal Infirmary, Edinburgh.	Irrigation and soaks	Every 6 hours.	Sloughs separated in 10 days. Discharge ceased and notable healing in 15 days.
8	Severe burn.	,, ,,	Eupad on gauze plus vaseline.	—	Rapid granulation and steady improvement; treatment not irritating.
9	Severe burn on thorax.	Capt. Stiles, Royal Hospital for Sick Children.	Eusol soak.	2 per day.	Sloughs entirely separated in 5 days. Child discharged 2 days later.
10	Cystitis; man aged 75; not expected to recover.	Col. Thomson, Royal Infirmary, Edinburgh.	1 in 8 irrigation.	,, ,,	Patient improving in 4 days. Discharged in 6 weeks.
11	Tuberculous periostitis with abscess formation and ulceration.	Capt. Miles, Royal Infirmary, Edinburgh.	Soak plus potassium iodide internally.	1 per day.	Operation; marked improvement in 6 days.
12	Tuberculous arthritis of knee; sinus.	,, ,,	Wet dressing.	—	Rapid healing after opening up and scraping.
13	Tuberculosis of tarsus; scraping.	,, ,,	Eupad 1 day, wet dressing subsequently.	—	Clean and healing in 7 days after operation.
14	Sinus, tuberculous, 4 years' standing	,, ,,	Eupad gauze 3 days; soaks plus potassium iodide internally.	—	Completely healed in 7 weeks.
15	Specific ulcer.	Capt. Chiene, Royal Infirmary, Edinburgh.	Soaks.	1 per day.	Ulcer healthy in 14 days.
16	Specific ulcer; very foul.	,, ,,	,,	,, ,,	,, ,,
17	Lacerated wounds (scalp).	Mr. Alexander, Royal Infirmary, Edinburgh.	Eupad rubbed in.	—	In 48 hours wounds clean.
18	Crushed pelvis; extensive cellulitis (accident).	Capt. Dowden, Royal Infirmary, Edinburgh.	Eupad applied freely, 3 to 4 drachms. Later lavage of bladder with eusol.	Later half strength, 2 per day.	Case discharged cured in 8 weeks.
19	Hydatid cyst.	,, ,,	Douched 2 pints, half strength.	—	Cavities drained; satisfactory recovery in both cases.
20					
21	Septic cellulitis.	Capt. Stiles, Chalmers' Hospital.	Eupad and eusol.	Soak 4-hourly.	Cellulitis much decreased in 6 days.
22	Tuberculous osteomyelitis; sinus.	,, ,,	Soak.	2 per day.	Treatment began 21 days after operation; previous treatment H_2O_2. Practically dry in 3 weeks.
23	Necrosis of lower jaw for 6 months (operation).	Capt. Stiles, Royal Hospital for Sick Children.	Eupad and eusol, half strength.	1 per day.	Very little discharge after 6 days.
24	Tuberculous hip-joint; fifth admission; amputation through joint.	,, ,,	Eupad at operation. Syringe and soak, half strength subsequently.	,, ,,	Steady improvement for 20 days. Healed very quickly for a tuberculous case.
25	Acute abscess abdominal wall (opened).	,, ,,	Syringe and soak, half strength.	,, ,,	Wound healing in 2 days. Discharged in 9 days.
26	Acute popliteal abscess (operation).	,, ,,	,, ,,	,, ,,	Healthy granulation in 3 days. Steady healing.
27	Acute suppurative appendicitis; retrocæcal abscess.	,, ,,	,, ,,	,, ,,	Improving rapidly in 5 days.
28	Acute suppurative appendicitis; pelvic abscess.	,, ,,	,, ,,	,, ,,	Improving rapidly in 4 days.
29	Acute suppurative appendicitis; retrocæcal abscess.	Mr. Mitchell, Royal Hospital for Sick Children.	,, ,,	,, ,,	Improving rapidly in 6 days.
30	Acute suppurative appendicitis; abscess.	,, ,,	,, ,,	,, ,,	Improving rapidly in 2 days.
31	Acute suppurative appendicitis; retrocæcal and pelvic abscesses.	,, ,,	,, ,,	,, ,,	Improving rapidly in 9 days.

TABLE A.—CIVIL CASES (*Continued*).

No.	Disease.	Surgeon and hospital.	Mode of application.	Frequency of application.	Result.
32	Acute suppurative appendicitis; peritonitis and pelvic abscess.	Mr. Mitchell, Royal Hospital for Sick Children.	Syringe and soak, half strength.	1 per day.	Improving rapidly in 8 days.
33	Acute appendicitis; gangrenous; drained 4 days.	,, ,,	,, ,,	,, ,,	Wound healed by first intention by 8th day.
34	Acute appendicitis; general peritonitis.	,, ,,	,, ,,	,, ,,	Rapid recovery.
35	Acute suppurative appendicitis; retrocæcal abscess.	Miss Herzfeldt, M.B., Royal Hospital for Sick Children.	,, ,,	,, ,,	Improvement in 3 days.
36	Acute streptococcal infection of thumb; marked lymphangitis; axillary glands tender. Temperature 103·2° F.; 2 operations (nurse).	Capt. Stiles, Royal Hospital for Sick Children.	Eupad at operations; eusol baths and soaks.	6 hourly.	Eusol baths relieved pain; wound healed rapidly after second operation.
37	Tuberculosis of fibula; sinus. Excision of part of fibula.	,, ,,	Eupad at operation; soaks.	1 per day.	In 2 days very little discharge and healthy granulation. Healed in 5 weeks.
38	Sarcoma of jaw.	Lieut.-Col. Cathcart, Longmore Hospital for Incurables.	Dry dressing.	2 per day.	No effect.
39	Epithelioma of neck.	,, ,,	Washed and dry dressing.	,, ,,	Discharge greatly diminished.
40	Malignant ulcer (face).	,, ,,	Syringe and soak.	,, ,,	Great improvement.
41	Tuberculous empyema.	,, ,,	,, ,,	1 per day.	Discharge much reduced.
42	Cancer of lower jaw.	,, ,,	Wet packs.	2 per day.	Very greatly diminished discharge.
43	Cancer of vagina.	,, ,,	Douche.	1 per day.	No definite change.
44	,, ,,	,, ,,	,,	,, ,,	Discharge less and much less offensive.
45	Gonorrhœal discharge.	Dr. T. Y. Finlay, Craiglockhart Hospital.	Injection of eusol, 1 in 5.	Three injections.	Discharge for 24 days; stopped in 5 days. Burning pain at first on injection, but decreased as discharge lessened, and finally ceased.
46	,, ,,	,, ,,	,, ,,	Five injections.	Discharge stopped in 8 days. Pain experience similar to 45.
47	Cut on scalp in street accident; very dirty.	Mr. Jardine and Lieut. Cameron.	Eusol freely.	Daily injections.	Completely cured in 14 days.
48	Crushed finger.	,, ,,	Eusol soak for 12 hours before operation, then dry dressing.	,, ,,	Rapid healing. (Note: Eusol soaks to small, dirty wounds for 12 to 24 hours before operating or stitching have been found very successful; drainage may then be dispensed with.)
49 to 76	Tuberculous otitis media (4 cases).	Dr. Logan Turner, Dr. J. S. Fraser, Dr. H. Chaffer, Ear and Throat Department, Royal Infirmary, Edinburgh.	Syringe, half strength.	2 per day.	Eminently satisfactory.
	Tonsillectomy and enucleation of tonsils (many cases).	,, ,,	Sprayed.	—	Membrane disappeared rapidly; fœtor of breath diminished; wound rapidly granulated.
	Operation for polypus of antrum (2 cases).	,, ,,	Douche.	2 per day.	Rapid recovery.
	Suppurative otitis media (7 cases).	,, ,,	Syringe.	,, ,,	All satisfactory.
	Atrophic rhinitis (2 cases).	,, ,,	,,	,, ,,	No better than other methods.
	Mastoiditis (1 case).	,, ,,	,,	,, ,,	Rapid improvement.
	Radical mastoid operation (8 cases).	,, ,,	,,	,, ,,	Quite satisfactory.
	Cerebellar abscess (2 cases).	,, ,,	,,	,, ,,	Healed in 1 week.
	Cerebral abscess (1 case).	,, ,,	Eupad and eusol.	—	Quite satisfactory.
77 to 88	Eye disease (11 cases).	Dr. Traquair, Eye Department, Royal Infirmary, Edinburgh.	"Eusol and eupad while in some respects efficacious did not show any advantages over weak simple lotions."		
89	Acute appendicitis; general peritonitis.	Mr W. Q. Wood, Leith Hospital.	Douche through abdominal cavity, half strength; later syringing with eusol.	2 per day.	Great improvement in a week. Wound nearly closed 6 days later.
90	Lacerated septic wound, hand.	,, ,,	Wet dressing.	,, ,,	In a few days sepsis gone; skin grafting.
91	Crushed finger, amputation; persistent sinus.	,, ,,	Syringing and wet dressing.	1 per day.	Sinus had persisted for 3 months. Healed in 4 days with eusol.
92	Cellulitis of elbow.	,, ,,	Eupad applied to incisions.	—	Good recovery.
93	Septic wound in groin following abscess on foot.	,, ,,	Wet dressing.	2 per day.	Sepsis had persisted for 3 months. Pus disappeared and healthy granulations in 4 days.
94	Partial avulsion of the scalp.	Mr. J. M. Graham.	Sponging with gauze soaked in eusol.	—	Healing by first intention.
95	Severe laceration of right arm; fracture of humerus.	,, ,,	,, ,,	—	,, ,,
96	Severe crush of both hands.	,, ,,	Irrigation with eusol.	—	Healing very satisfactory.
97	Compound comminuted fracture of elbow region.	,, ,,	,, ,,	—	,, ,,
98	Ulcerated wound of leg.	Lieut.-Col. Caird.	Dressed with eusol.	—	Satisfactory progress.
99	Compound fracture of humerus.	,, ,,	Eusol purification.	—	Good result.

Details of Cases Treated in Surgical Out-patient Department.

Accidental Wounds which did not become Septic.

Case.
2. Lacerated wound.
3. Cut from glass.
7. Contused wound.
9. ,, ,, (head).
10. ,, ,,
11. ,, ,,
12. Cuts.
13. Lacerated wound (cheek).
15. Contused wound (head).
16. ,, ,,
19. ,, ,,
20. Lacerated wound.
21. ,, ,,
22. Contused wound.
23. Crushed toe.
24. Glass cuts.
25. Cut.
26. Lacerated wound.
27. Contused ,, (scalp).
28. Cyst operation (thumb).
29. Contused wound.
30. ,, ,,
31. Cut and bruises.
33. Cut and contused wound.
35. Contused wound.
36. ,, ,, (forehead).
37. ,, ,, (scalp).
38. ,, ,, (forehead).
39. ,, ,, ,,
40. Cut.
41. Contused wound (scalp).
42. ,, ,,
43. ,, ,,

Case.
44. Lacerated wound.
45. Cut.
46. Lacerated wound (finger).
47. Contused ,,
48. Lacerated ,,
49. Contused ,,
51. ,, ,, (eyebrow).
53. Lacerated wound.
56. Contused ,,
59. Lacerated ,,
62. Amputation (fingers).
63. Contused wound.
65. Lacerated ,, (finger).
66. ,, cut (ear).
68. Crushed hand.
69. Cut hand.
70. Contused wound.
71. Crushed finger.
72. ,, ,, (amputation).
76. Contused wound (forehead).
82. ,, ,,
84. Cut hand.
85. Punctured wound.
88. Cut heel.
90. ,, ear.
91. ,, eyebrow.
93. ,, head.
95. ,, forehead; dirty.
96. ,, foot.
97. Crushed finger.
98. Cut hand.
99. Lacerated finger.
100. Cut scalp.

Wounds Already Septic.

Case.	Disease.	Result.
4	Contused wound, very septic.	Rapid cleaning.
5	Septic wound of head.	Cured in 5 days.
6	Septic finger.	,, 3 ,,
18	Septic wound of scalp.	,, 4 ,,
54	Abscess of foot.	,, 5 ,,
55	Septic hand.	Satisfactory progress.
57	Septic wound of knee.	,, ,,
60	Abscess.	Healed in 8 days.
64	Septic wound of foot.	Wound healing in 9 days (irregular attendance).
67	Septic hand.	Cleaned in 2 days.
73	Septic foot.	,, ,,
74	Abscess.	,, ,,
75	Crushed toe.	Discharged healed in 10 days.
77	Varicose ulcer.	Cleaned in 3 days.
78	Ulcer on leg.	Had tried everything; eupad cleaned in 1 day.
79	Lacerated wound; septic.	Cleaned in 13 days (irregular attendance).
81	Abscess of knee.	Healed in 4 days.
83	Crushed finger.	Discharged healed in 11 days.
86	Septic thumb.	Cured in 10 days.
87	Septic sore of 3 weeks' duration.	Satisfactory progress.
89	Cut on scalp; 7 in.; kick by horse.	Healed in 17 days.
92	Whitlow.	Cured in 14 days.
94	Spike wound of thigh, 3 in. deep.	,, 5 weeks.

Accidental Wounds which became Septic after Treatment.

Case.	Disease.	Remarks.
1	Slight sepsis.	Patient missed 7 days and came back septic.
14	Contused wound of hand.	Dressing removed by patient.
17	Lacerated wound.	Slight sepsis.
32	Lacerated fingers.	,, ,,
34	Contused wound.	No dressing for 3 days.
50	,, ,,	Three days no dressing; sepsis cured by one soak.
52	,, ,,	Slight sepsis; dry dressing not sufficient.
58	Cut hand.	,, ,, ,,
61	Contused wound of scalp.	,, ,, ,,
80	Contused wound of scalp.	No dressing for 6 days.

TABLE B.—MILITARY CASES.

THE MILITARY HOSPITAL, EDINBURGH CASTLE.

(See note by Captain Beesly, Tabulation and Analysis of Special Cases, Section 2, *infra*.)

SECOND SCOTTISH GENERAL HOSPITAL, CRAIGLEITH.

Captain W. J. Stuart.

No.	Age of wound	Nature of wound.	Mode of application.	Result.
1	Recent.	Large scalp wound infiltrated with road dirt.	Freely washed and wet dressed.	Healing by first intention.
2	,,	,, ,,	,, ,,	Ditto, except at one point.
		Captain Chiene.		
3	3 days.	Sloughing muscle.	Soak, half strength, 1 per day.	Clean; granulation in 20 days.
4	10 ,,	Bullet; gutter wound of thigh.	,, ,,	Sloughing wound: healed in 3 weeks.
5	9 ,,	Bullet wound of back, septic and sloughing.	,, ,,	Almost healed in 4 weeks.
6	10 ,,	Flesh wound of back, dirty, sloughing.	,, ,,	Wound sterile in 8 days. Healing rapidly.

EDINBURGH WAR HOSPITAL, BANGOUR.

Lieutenant-Colonel Cathcart and Dr. Laura K. Davies.

7	26 days.	Compound fracture of femur. Septic and discharging.	Soak and syringe 3 per day.	Wound sterile after 30 days.
8	8 ,,	Bullet, thigh. Septic and discharging.	Soak 2 per day.	Healed rapidly.
9	8 ,,	Shell, arm, knee, 2 feet. Septic and discharging.	Soak 2 per day.	Wounds sterile in 9 days. Healed up in 13 days.
10	8 ,,	Shell wounds. Discharging.	Soak 2 per day.	Healed up in 11 days.
11	6 ,,	Shell, thigh. Septic.	Syringe and soak 3 per day.	Discharge was copious and fœtid. Great improvement in general and local conditions in 5 days.
12	7 ,,	Bullet, arm. Septic and discharging.	Soak 3 per day.	Wound healing well in a fortnight.
13	8 ,,	Bullet, thigh. Discharging.	Soak 2 per day.	Steady and rapid improvement; nearly healed in 12 days.
14	8 ,,	Compound fracture of humerus, comminuted. Septic and discharging.	Syringe and soak.	Wound sterile in 25 days.
15	8 ,,	Bullet, leg. Free discharge.	Soak 2 per day.	Sterile in 25 days.
16	21 ,,	Compound fracture of femur. Septic and discharging.	Soak 3 per day, syringe.	Rapid bone union; discharge kept up by sequestra.
17	7 ,,	Deep punched-out shell wound of left thigh. Septic and discharging.	Syringe and soak, 3 per day.	Marked improvement in 9 days.
18	8 ,,	Bullet wound of back. Septic and discharging.	,, ,,	Discharge decreased. Healing slow.
19	6 ,,	Gunshot wound of left shoulder and jaw. Septic and discharging.	,, ,,	Rapid healing.
		Captain Miles.		
20	92 ,,	Compound fracture of tibia.	Irrigation, 2 per day.	Leg much swollen; copious discharge. Discharge stopped in 50 days.
21	82 ,,	Compound fracture of femur.	Packing and irrigation.	Copious discharge of pus. Several pieces of dead bone removed; wound healed thereafter in 1 month.
22	53 ,,	Compound fracture of tibia. Foul pus.	Pack and syringe, 2 per day.	Great improvement, but not ceased in 7 weeks.
23	53 ,,	Compound fracture of tibia. Discharging green pus.	Pack plus eupad, plus syringe.	Wound healed in 5 days.
24	55 ,,	Sinus of calf of leg. Foul discharge.	Pack plus eupad; irrigation.	Healed in 7 days.

ROYAL INFIRMARY.

Major Hodsdon and Mr. Wood.

No.	Age of wound.	Nature of wound.	Mode of application.	Result.
25	21 days.	Amputation on hospital ship. Gangrenous amputation flaps.	Dry dressing 1 per day.	Stump healed in 7 weeks.
26	10 ,,	Compound comminuted fracture of elbow.	Syringe and wet dressing, 1 per day.	Healed very rapidly after operation.
27	10 ,,	Compound fracture of ulna.	,, ,,	Practically healed in 1 month.
28	9 ,,	Shell splinters in hand.	,, ,,	Healed in 15 days.
29	9 ,,	Compound fracture of femur.	Syringe 2 per day.	Sequestrum removed. Healed in 5 weeks.
		Captain Miles.		
30	6 ,,	Septic bullet wound of forearm.	Eusol and hot fomentations.	Wound healed satisfactorily.
31	7 ,,	Bullet wounds of back and legs.	Eusol soaks and spray.	Both wounds discharging freely; cleaned up rapidly.
32	30 ,,	Amputation stump of thigh.	Soaks.	The stump had been left conical on account of septic condition of leg. Very septic on admission; cleaned very satisfactorily with eusol.
		Mr. Alexander.		
33	16 ,,	Septic ulcer of hand.	Soak, half strength, 1 per day.	Healed rapidly.
34	16 ,,	Bullet wound of thigh. Septic.	Soak, half strength; then full strength.	Rapid healing.
35	16 ,,	Perforating wound of foot. Septic.	Soak, half strength.	Painless healing.
36	18 ,,	Amputation flaps of knee. Septic.	,, ,,	Rapid granulation.
37	16 ,,	Bullet wound. Septic.	,, ,,	Satisfactory.
38	16 ,,	Bullet wound. Septic.	,, ,,	,, ,,

DEACONESS HOSPITAL.

Captain Stuart and Dr. Andrew Rutherford.

39	16 days.	Shell wound of foot. Very septic.	Soak, 2 per day.	Wound sterile in 20 days. Discharged in 1 month.
40	16 ,,	Amputation flaps of thigh.	Soak, flooded every 4 hours	Fœtid pus. Flaps sterile in 20 days. Very rapid healing.

DALMENY HOUSE HOSPITAL.

Major Wallace and Dr. Bennet Clark.

41	17 days.	Large superficial wound of leg.	4-hourly soak.	In 18 days skin grafting successful. Practically healed 16 days later.
42	31 ,,	Septic amputation flaps of leg.	,, ,,	Discharge practically ceased and rapid healing in 8 days.
43	48 ,,	Foul superficial wound of shoulder.	,, ,,	Discharge stopped and rapidly healing in 10 days.
44	16 ,,	Compound comminuted fracture of clavicle. Deep wound.	4-hourly soak plus eupad once in 24 hours.	Wound healed in 1 month. Small fragments of bone frequently discharged throughout the month.
45	10 ,,	Deep ragged bullet wound of forearm.	Irrigation and 4-hourly soak.	Discharge ceased in 10 days.
46	135 ,,	Sinus of dead bone. Operation for sequestrum.	Syringing twice daily.	Rapid healing.
47	48 ,,	Compound comminuted fracture of humerus.	,, ,,	Discharge ceased altogether. Wound dry and healed in 5 days.

Dalmeny House Hospital (continued).

No.	Age of wound.	Nature of wound.	Mode of application.	Result.
48	17 days.	Sinus of upper arm.	Soaks 14 days; no good. Syringe twice daily; good in 24 hours.	Practically healed in 3 days after change of method.
49	48 ,,	Compound fracture of shoulder (scapula).	4-hourly soak.	Discharge after 7 days almost negligible. Wound closing in 11 days.
50	Special Case.	Chronic osteomyelitis.	Irrigated for 14 days.	After 14 days irrigation wound was quite clean and stimulating dressings were then adopted.
51	,,	Sequestrum of tibia (operation).	Irrigation and dry dressing 2 per day.	Wound healed from the bottom without packing in 1 month.
52	10 days.	Foul lacerated superficial wound of arm.	4-hourly soak.	Skin-grafting after 8 days. Eusol very successful.
53	10 ,,	Sinus: calf of leg.	Irrigation 2 per day.	Discharge much less in 2 days; slough separating fast. Healed in 3 weeks.
54	11 ,,	2 sinuses, chest and shoulder: bullet wound.	,, ,,	Sloughs cleaned up in 1 week after eusol. Exit wound healed in 3 weeks.

VICTORIA RED CROSS HOSPITAL.

Dr. R. W. Johnstone.

55	—	Ulcer on neck.	Irrigation 1 per day.	Sterile in 8 days.
56	19 days.	Four superficial shell wounds.	,, ,,	Healed in 1 week.
57	8 months	Compound fracture of femur; 6 operations.	Irrigation and packing.	Sinuses healed in 6 weeks.
58	3 months	Compound comminuted fracture of foot.	,, ,,	Wound cleaned; serous discharge persisted.

Tabulation and Analysis of Special Cases.

The cases recorded in the tables may be classified under the following headings:—

1. Recent accidental wounds.
2. Wounds already septic: (*a*) Superficial; (*b*) deep flesh wounds with or without foreign bodies; and (*c*) compound fractures, with splintering, necrosis, &c.
3. Conditions in serous and synovial cavities.
4. Conditions on mucous surfaces.
5. Inflammatory lesions: (*a*) Cellulitis; (*b*) abscess; (*c*) amputation through septic tissues; (*d*) arthritis with mixed infection—amputation; and (*e*) tuberculous bones.
6. Skin infections.
7. Operations for carcinoma: (*a*) rectum; and (*b*) mamma.

The records of the civil cases include acute appendicitis, operations for carcinoma of rectum and mamma, varicose ulcer, tuberculous lesions, cellulitis and abscess from micrococcal infection, necrosis of bone, necrosis of scalp from contusion, specific ulcers, cystitis, and gonorrhœal urethritis. There is also a series treated in the surgical outpatient department of the Royal Infirmary and other recent accidental wounds. A special list of cases treated in the ear and throat department of the Royal Infirmary has been included. In addition, there is a series from the Longmore Hospital for Incurables showing the extent to which eusol has been applied in the alleviation of chronic discharges and the elimination of fœtor.

The records from military hospitals include the following: Superficial wounds, deep flesh wounds, fractures and injury to bone (including necrosis), and septic synovitis. The wounds were all septic when the patients reached the hospitals. Except in a few cases of recent accidental wounds, the interval between the receipt of the wound and entry to hospital varied from one to three weeks; in many cases the interval was longer, treatment having already been carried out in another hospital.

(*To be continued.*)

THE LANCET.

LONDON: SATURDAY, FEBRUARY 5, 1916.

Venereal Disease in the Army.

WE have received the January number of the *Shield*, the quarterly organ of the Association for Moral and Social Hygiene, and our attention has been invited to an article referring to the incidence of venereal disease amongst the troops as being very serious. The objects of the association, as our readers probably know, are to raise the standard of character and conduct in sexual relations, to secure the recognition of an equal standard of morality for men and women, and to eradicate prostitution and kindred evils. These things are to be effected by the promotion of such reforms—legislative, administrative, social, educational, and hygienic—as tend to encourage morality in public and private walks of life, while the commercial exploitation of vice and all forms of official regulation of prostitution are vigorously opposed. The proven virtues and the probable limitations of the work of the association will be indicated to our readers by their programme. The known failure of the regulation of prostitution, whether due to the inherent immorality of the system or to the great difficulties in its administration, is the forefront of the policy of the promoters of the association, so that the occurrence of circumstances in which regulation, in some form or other, might be of service to our young soldiers would never be allowed to count in their estimation as outweighing the mischief of purchasing the physical health of the troops by a recognised degradation of a class of women.

The article deals with the prevalence of venereal disease in a well-known military centre and states publicly the fact which for many reasons the medical press had been requested not to mention—viz., that the civic authorities of a certain popular watering-place have welcomed a deputation from the National Council for Combating Venereal Disease, because of the rapidly increasing incidence of gonorrhœa and syphilis among the troops in the area. Fortunately the conditions have vastly improved in the last few weeks. But while we deprecate the mentioning of particular military areas in connexion with the prevalence of any disease, we think that the circumstances in respect of sexual difficulties, which may be common to many places where a large number of troops are congregated, form a very proper subject of comment. The population of every place which has during the last 18 months been transformed into a military centre, as well as the county or municipal authorities of that place, ought to understand the situation, and they are helped to do so by free comment, which may assist the military organisation at the same time. In many military centres there has been, at different times and since the enrolment of large numbers of young troops, a deplorable prevalence of venereal disease, and great difficulty has been experienced on the part of all forms of local government in dealing with the circumstances. Young men living in the *milieu* in which soldiers do live, and stirred by an unwonted spirit of adventure, must make exceedingly easy game for the temptress. The problem is how to help the men to curb the sexual impulses, and while protecting the soldier, who is himself protecting our hearths, homes, and liberties, neither to legitimise any form of vice nor to be unduly brutal to her whom we have styled temptress, but who, taking larger social views, must be regarded as rather sinned against than sinning. It is clear that we do not recruit young men to fight for us, and then submit them to exceptional sexual dangers, without, as a country, undergoing an appalling responsibility. That the young men should give their lives for their country, if fate so wills it, is all we should ask of them: that they should be protected from all forms of risk to health and character, which we can foresee will assail them, is a most urgent duty upon the community. Moreover, from the business point of view it is very expensive to have a large sick bill among the troops. Both officers and men ought to be guarded from all chances of disease wherever possible, although the best way in which this should be done in respect of venereal disease is, always has been, and, it seems, always must be hard to find.

What practical courses are open to physician or reformer? It is possible to provide the men with apparatus and with instructions for use which would much modify the risk of infection. This, we believe, has been done successfully in certain foreign navies, but to give any directions for the issue of such protective appliances to our troops would be a recognition of vice that would entail widespread protest. Those who recommend this method of combating the danger hardly recognise what the strength of that protest might lead to. The examination of prostitutes and the placing of them under legal penalties would undoubtedly have a restrictive effect upon venereal disease at the present time, and in the centres where it is imperative that the ravages of gonorrhœa and syphilis should be repressed. It would scare certain women into chastity; it would prevent others from being foci of poison. Yet it is perfectly well known that the army authorities are decidedly opposed to calling this method of dealing with the mischief to their assistance. Its failure in the normal conditions of life has been widely admitted, and although the conditions in which it would now be introduced are widely removed from the normal, recourse to the repugnant machinery involved would find few advocates. The education of the men in the dangers of illicit intercourse is a weapon against evil which most admit to have great value, and for the moment it is the one upon which the chief reliance is being placed.

The lecturers who are demonstrating these dangers to the troops may be trusted, as their individual temperament prompts them, to dwell upon the value of self-control and self-respect, the duty of a chivalrous bearing towards women, and the responsibility owed by every generation to the one that follows it. All this conforms exactly to the ideals of the Association for Moral and Social Hygiene, and is, in our opinion, of great efficacy; but more could be done. Women known to be living by prostitution in areas where troops are aggregated should be deported. This suggestion is entirely opposed to the whole spirit of the Association for Moral and Social Hygiene, for it is in the forefront of their policy that there should be but one law in sexual matters for man and woman. Now it is not feasible to remove from the ranks or from their military centres the men who have contracted venereal disease. But the removal of prostitutes from the areas in the neighbourhood of large camps to places where their potentialities for evil would be infinitely less is a practical measure. It can and should be done, and power should be obtained for this end, and for preventing further invasion of the localities by prostitutes. If this policy seems to be punishing one partner only for the sin of two it must be remembered that a poisonous woman can poison a regiment, and it should be a point of conscience with our authorities to let nothing outweigh in their minds the meaning of this fact. The female police, who have already been found efficacious, and the female rescue-workers could between them take care that no mistakes were made as to the sort of women who should be deported from military centres or prevented from entering them.

A Discussion on Shell Shock.

THE special discussion on functional neuroses caused by shell shock, which took place at the Royal Society of Medicine on Jan. 25th and 27th, proved to be of a very practical character. Major F. W. MOTT'S address occupied the greater part of the first evening, but as he is dealing with this subject at length in the forthcoming Lettsomian lectures we need not do more than record the fact here. Much variety of opinion on origin, symptoms, and treatment came to light. Indeed, Dr. HENRY HEAD was not even content to allow the separate existence of the subject under discussion, holding it to be a heterogeneous collection of different nervous affections from concussion to sheer funk, which have merely this much in common that nervous control has at last given way. To him it would be just as reasonable to sweep up the various fruits which fall from the trees in a strong wind and then to discuss them without first stating that some fell from an apple and some from a pear tree. A contributory cause of the vagueness of the condition is the fact that so little is known of its pathological anatomy since, fortunately, recovery is the rule. Dr. WILFRED HARRIS recounted a case showing typical symptoms of disseminated sclerosis following on a shell shock, and elicited from Major MOTT the information that a man who had recently died 48 hours after a severe shock was found to have scattered hæmorrhages throughout the substance of the brain. These hæmorrhages would in due course, if the man had survived, have resulted in areas of sclerosis, possibly sufficiently severe to occasion definite symptoms. Small scattered hæmorrhages may well be at the root of some of the slighter cases where symptoms obstinately persist.

In regard to the causation of the condition it was forcibly pointed out by Dr. JAMES COLLIER that the conceptions of concussion and psychic trauma were antagonistic the one to the other. Dr. COLLIER regards the real causative agent as a conscious realisation of the sensory symptoms of the shock. Were the shock sufficient to produce immediate unconsciousness, not this train of symptoms would follow, but an altogether different one, as is seen when the shock is accompanied by a severe wound. For example, a man wounded by a fragment of shell which had entered the orbit, exposing the dura mater and rendering him unconscious, suffered from severe concussion, and recovered without any trace of shell shock. Those who took part in the debate agreed generally that if the explosion were of sufficient severity shell shock could be produced even in a previously healthy brain. A contributing factor in some cases was doubtless the inhalation of poisonous gases, especially carbon monoxide, left in trenches and dug-outs after the explosion of a shell. In cases of sudden onset the average age of the men had been found to be distinctly lower than in those where the onset was gradual. At the Maida Vale Hospital Dr. E. G. FEARNSIDES'S analysis of 70 cases afforded an illustration of this. The cases of gradual onset were rather among the older non-commissioned officers in whom a breakdown occurred after a prolonged period of stress when adequate sleep had for long been unobtainable. The relation to epilepsy was rather fully discussed. The matter has a considerable practical importance as there were epileptics in the old army, and it is possible that the village idiot and his kind have been drafted not infrequently into the new one, though in most cases only to fall out at an earlier stage of the training. On the other hand, the shock of a high-explosive shell has not infrequently been found to be the starting point of true epilepsy in men who had not previously suffered from it. Amongst other symptoms of shell shock loss of memory is generally a striking feature. Major MOTT'S observation that the memory for music returns relatively early was confirmed by others. Dr. H. CAMPBELL THOMSON regarded the loss of memory as of a peculiar type in which a man remembered what he had been taught and entirely lost the mere incidents of his daily

life. He quoted the case of a man suffering from shell shock who could read and write quite well, had no defect of speech, but who had lost all his previous experience, and when taken to the Zoological Gardens attempted to stroke a lion and was ingenuously surprised to find that an elephant was larger than a cat. This man remembered tunes. It was generally agreed that the symptoms of shell shock were constantly liable to recrudesce in patients after a dream or a nightmare which almost always took the form of reproducing the conditions of the original shock. This form of contemplative fear was very distressing, as in a typical case described by Major MOTT of a man who on recovering sufficiently to crawl out of a crater caused by an explosion found all his comrades lying dead. His nightmares took the form of a repeated revisualisation of this scene.

The treatment of shell shock received consideration, and was perhaps the aspect of the condition on which opinion varied most. Doubtless this was due in part to a variety in the clinical material itself. Dr. F. E. BATTEN recounted his failure with suggestive treatment to cure the Belgians with whom he had to do; possibly, he admitted, the difficulty of intimate communication may have been a contributing factor. Mr. W. H. H. JESSOP laid stress on the value of making a friend of the patient in assisting him to recovery. A slight narcotisation with ether had immediately cured a few but not many of Dr. COLLIER'S patients. A similar beneficial effect had been produced by the exhibition to others of an Irishman who possessed the mirth-provoking power of being able to advance either ear separately to punctuate his conversation. Dr. HEAD emphasised the uselessness of treating acute dread by putting a man to bed and treating him with electricity. Several speakers agreed on the intimate relation of syphilis to refractory cases of shell shock and the striking result obtained from galyl and similar remedies in certain cases which had failed to respond to rest and psychic treatment. The discussion will undoubtedly lead to a closer touch between the many workers on this interesting subject, and is likely to have a far-reaching effect on its study in the future.

DEATH FROM TETANUS AT BARNSTAPLE.—An inquest was held on Jan. 18th on the body of a labourer aged 66, who died from tetanus in the North Devon Infirmary, Barnstaple, after having had two fingers cut off on Dec. 22nd by a circular saw, a third being left hanging. This was removed and good progress made until Jan. 2nd when symptoms of tetanus set in. Antitetanus serum was given, but the man died on Jan. 15th. The coroner stated that the medical profession might take more than the ordinary precaution when cases of this kind came in, and under existing conditions in North Devon always inject serum as a precautionary measure. The surgeon in charge replied that he had followed the usual practice in the matter. He had only seen two cases of tetanus in 20 years, and as soon as the first symptom appeared he had administered the serum. It is evident that the coroner's suggestion of administering a prophylactic dose of antitetanus serum in the case of every dirty wound would involve a very heavy expenditure, and one possibly not justified by results in places where tetanus is a rare complication.

Annotations.

"Ne quid nimis."

THE IMPORTANCE OF SCIENCE TO THE STATE.

A REMARKABLE memorandum has been issued this week bearing the signatures of leading men in every branch of science, and alleging a state of mental equipment among our rulers which is discreditable to the whole country rather than to the governing classes. The document states frankly that the checks which we have sustained since the war began can in large part be attributed directly and indirectly to a lack of knowledge on the part of our legislators and administrative officials of ordinary scientific matters. One instance of such ignorance is quoted. The exportation of lard to Germany was not prevented at first, as Ministers were not aware that glycerine could be made from it, and later it was actually declared, in a public statement of a member of the Government, that it was only recently discovered that glycerine could be obtained from lard. This statement is commented upon in the memorandum as surprising, and, indeed, it is astounding when we reflect that glycerine was discovered by Scheele in 1779 and was soon after shown to be the invariable constituent of all fats. And the fat from which glycerine was first isolated was actually lard, and reference to the chemical authorities shows us that all this happened 137 years ago. Well may the distinguished signatories to this memorandum declare that not only are our highest Ministers of State ignorant of science, but that the same defect runs through almost all the public departments of the Civil Service. Alas, this ignorance is universal in the House of Commons. That it should be shared by the general public is not surprising, but it is only too well known that a large proportion of those engaged in industrial and commercial enterprise do not really understand scientific questions, though they may know their own *métiers* in a rule-of-thumb manner. The memorandum is a powerful appeal to our great centres of administration, education, and commerce to lose no time in making a vigorous and serious effort to remedy our national position in respect of science. It is one to which we have often alluded as scandalous, and its deadly perils are now apparent. We must establish on a practical basis a system of scientific education. It is an anachronism in these days of great scientific achievement and application that the efficient conduct of the war should be in the hands of those who know nothing of science outside the science of government. Of course, the members of the Government and the heads of departments take care to be well advised, but they lose all power of initiative by not being able to estimate the value of the advice which they receive, or to translate it into terms which can be understood by the people. In the days to come we must alter this, and the obvious way is to raise the standards of our scientific education, and to make a scientific equipment necessary to promotion in certain walks of public life.

THE TREATMENT OF DYSENTERY.

ALTHOUGH in this country epidemics of dysentery, or "the bloody flux," have not been much in evidence of recent years, the disease has come into considerable prominence since the outbreak of the war owing to the comparative frequency with which our troops, especially those operating in the Near East, have suffered from it. A number of our soldiers have died from the malady and a good many others have been invalided out of the army as a result of attacks. The treatment, therefore, of this serious disease has recently assumed an increased importance. In October last an influential assembly of military medical officers and other experts met at Alexandria to discuss this subject, under the presidency of Surgeon-General W. Babtie, V.C. The discussion was opened by Lieutenant-Colonel Sir Ronald Ross, consulting physician to the troops, who gave a general survey of the treatment of dysentery in its various forms,[1] and he was followed in turn by other military physicians, who described their recent experiences of dysentery in the hospitals under their charge in and around Alexandria. From what was stated it appears that the treatment of this disease is more complicated than would seem probable at first sight. Before the appropriate remedies can be applied it is necessary, first of all, to find out the particular form of dysentery from which the patient is suffering—that is, whether it is of the amœbic or the bacillary form, or, as sometimes happens, a combined infection of both kinds in the same individual. We gather from some statements made during the discussion that about 55 per cent. of the cases of dysentery under treatment in the military hospitals in Egypt have been of the amœbic type, and for these there is a general consensus of opinion that emetine is the best remedy so far available. The allegation made by some observers that this drug, even in ordinary doses, is liable in certain instances to give rise to serious depression ending occasionally in death, was considered not to be proved. The few cases in which a fatal termination was recorded could, it was maintained, be explained by other causes than the administration of emetine. While it is admitted that too large or too prolonged doses of this drug may have sometimes a depressing effect, leading even to heart failure, such result can be avoided by proper care; but the possibility that there may be idiosyncrasy to be considered should not be forgotten. The immediate settlement, by bacteriological methods, of the type of dysentery to be treated in a particular case is not always practicable, so that, pending the results of such investigation, and in order that no time should be lost, it has become the rule in a number of military hospitals to begin at once with the emetine injections; if no improvement follows in a few days it is possible to fall back upon the use of anti-dysenteric serum. Other remedies, such as bismuth in large doses, the salicylates, astringents of various kinds, and other drugs, have been employed at one or another stage of the disease. In some cases adrenalin has been given with advantage. In the more chronic cases of the amœbic sort, Sir Ronald Ross and some others expressed a partiality for the use of ipecacuanha powder after the emetine injections had been stopped. The importance of proper dieting of the patients and the value of rest in bed during the acute stages of the disease were emphasised by some of the speakers. Attention was drawn to the difficulties caused by concurrent infections in some dysenteric cases, typhoid being one of the most serious to be reckoned with. Among the Indian troops the presence of malaria or scurvy added to the difficulties of the diagnosis and treatment of dysentery. We have mentioned only a few of the interesting points which were raised at this important meeting, but the discussion may be said to afford a very useful summary of the present state of our knowledge of the treatment of dysentery in all its forms, and probably for this reason the report has been printed by order of the principal director, Medical Services, Mediterranean Expeditionary Force, Egypt and Malta.

[1] See also THE LANCET, Jan. 1st, 1916, p. 1.

A CONTRIBUTION TO THE TECHNIQUE OF RADIUM ADMINISTRATION.

LAST week we called attention to the first year's working of the Manchester and District Radium Institute, of which Sir William Milligan is honorary secretary and treasurer. The printed report which now reaches us contains a record of the experience gained and some observations regarding the technique of burying radium tubes in growths and the choice of cases for this treatment. These observations are as follows:—

1. Thorough aseptic technique is as necessary as in general surgery, because screened radium does not have a markedly antiseptic effect.

2. Screens containing tubes of radium emanation may be boiled since the internal pressure of the heated tubes is as a rule well below that of the atmosphere. The boiling of tubes containing radium salts is not worth while on account of the risk of breakage.

3. The object in radium treatment is to produce an adequate and even distribution of the rays throughout a tumour. Thus it is usually better to bury a number of weaker tubes in a growth than to employ one strong one for the same purpose.

4. Accurate implacement of a tube in a growth is essential. It usually happens, therefore, that it is better to make a large incision and expose the tumour than to push tubes blindly through a small cut in the skin. Is is, moreover, safer.

5. So far it has rarely been found possible to remove a cancer with a single dose. Too big a dose may produce a violent reaction with local necrosis of tissue.

6. The reaction or ulceration after an overdose may last a long time, but never fails to settle down or to heal completely in the long run, with the following exception.

7. A growth treated by radium must be surrounded by or contain an adequate quantity of healthy tissue capable of supplying sufficient assistance for the work of repair, otherwise a permanent malignant ulcer may be formed. It is better to attempt to treat recurrences situated in regions of low vitality by means of externally applied radio-active plates.

8. The quantities of radium and radium emanation which should be used vary according to the size of the growth, the thickness of the screen employed, and the situation of the tumour. Some malignant growths appear to need larger doses per cubic centimetre than others. If we could find out exactly the amount of radiation therapeutically needed per cubic centimetre of a tumour, and an accurate method of estimating the size of cancer growths, there would merely be left to the physicist a mathematical calculation of the quantities to be used to produce total absorption, and the use of a sufficient number of tubes would remove the possibility of local overdose.

9. In the treatment of malignant glands of the neck careful attention should be given to the toilet of the mouth. The presence of carious teeth may lead to septic infection of glands with definite abscess formation when the radium tube is introduced.

These observations will, we feel certain, be of practical use to other workers.

THE METROPOLITAN WATER-SUPPLY.

IN the report issued last week on the condition of the metropolitan water-supply during the month of October, 1915, it is shown that whereas 95·1, 99·9, and 47·6 per cent. of the samples of raw Thames, Lee, and New River water respectively contained typical B. coli in 1 c.c. (or less) of water, 83·9, 52·4, and 89·5 per cent. of the filtered water samples derived from these rivers contained no typical B. coli even in 100 times as much water—namely, 100 c.c. The month was fairly dry and seasonable, the rainfall measuring 2·06 inches, which is 0·66 inch below the average. Compared with previous averages, both the raw river waters and the filtered waters, speaking generally, either deteriorated or showed no change in the light of chemical analysis, while bacteriological examination showed in the raw waters fewer bacteria than their respective averages, the filtered waters giving satisfactory results. The importance of storage before filtration is again illustrated, and nearly the whole of the supply is now stored antecedent to filtration. As Dr. A. C. Houston points out, the improved condition of the water immediately antecedent to filtration is best expressed by saying that on the average about one-third of the pre-filtration samples contain no typical B. coli in 10 c.c. of water.

THE PROTECTIVE POWER OF CLOTHING AGAINST COLD AND DAMP.

NEARLY all physiological and hygienic researches on men's garments as a means of protection against cold and damp have hitherto laid the principal stress on one condition, that of porosity and hygroscopicity of the tissue, almost entirely forgetting another condition equally essential—namely, the presence of fatty material and its quantity and quality. In a report recently issued by Professor C. Terni in a series of "Medical Propaganda in War,"[1] attention is drawn to the fact that vegetables which possess only in the smallest degree the power of producing heat protect their most vital parts, the buds, with layers of cellulose and with an impermeable covering. But this protective layer is fatty, and therefore it may be assumed that protection against cold and damp in nature depends in a large measure on the presence of these fatty substances more than on any special qualities of the tissue itself. Professor Terni urges the importance, therefore, of more serious attention being given to the amount of fatty material in clothing. Wool possesses naturally both a maximum of porosity, owing to the conformation of its fibres, and an adequate amount of fatty material, but in process of manufacture it is deprived of its natural fat which would become rancid, and it is therefore necessary to restore its fatty nature by stable fats which become fixed in the fibres and remain adherent even at a low temperature. Commercial enterprise has overcome this difficulty, and it is possible to obtain material of fatty wool in a condition best adapted for protection against cold and damp. There are two objections to it, however—namely, expense and weight, and Professor Terni is of opinion that cotton composed of twisted fibres, and having a large content of fatty material of a much more stable character than that of animal origin, can be spun and woven with very small loss of this fat. By this method we can obtain one of the most economical of coverings, equal to wool in its efficiency against cold and damp, and, moreover, with a marked reduction in weight, a point of real importance to all those who have to work while on the move.

[1] Il Morgagni, Part II., Dec. 2nd, 1915.

THE GOAT AS A SOURCE OF MILK.

A VERY interesting circular has been issued, amongst others this week, by the Board of Agriculture and Fisheries, pointing out how in certain districts goat-keeping might be extended with advantage. It is well known that many cottagers and others living outside the area of retail delivery find it difficult to obtain milk for their families. The large dairy farms are, as a rule, under contract to supply milk to distributing agencies in towns, or else they turn their milk into cheese and butter. As the Board rightly says, all the objections which apply to the keeping of a cow by a cottager would be met in the case of a goat. The first expenditure for its purchase is within his means, the housing accommodation is reduced to a minimum, the food costs little, and there is no great expense to be borne for the maintenance of the animal. Even in the event of a cow's milk supply being available, goats may profitably be kept to supply milk for domestic use. It is, as a rule, a most wholesome milk, and its flavour, if the food of the animal is regulated, is not any real drawback to its employment. Moreover, goat's milk is easily digested by children, and especially infants, and, as is well known, it is far less likely than cow's milk to contain tubercle bacilli of animal origin. The average goat will give at its flush three pints of milk a day, and, on the whole, calculations based on extreme cost of keep, outlay, and so forth, show that while a good supply of milk could be maintained, a very fair profit could be made. The suggestion is a valuable one, and the information contained in this circular as to how to start goat-keeping, as to the choice of breeds, as to breeding itself, housing, feeding, tethering, milking, and the care of the milk, and so forth, should be spread up and down the land. We append the composition of goat's milk compared with human milk and cow's milk:—Goat's milk: Water 86·04 per cent., fat 4·63 per cent., sugar 4·22 per cent., casein 3·49 per cent., albumin 0·86 per cent., and mineral matter 0·76 per cent. Human milk: Water 88·2 per cent., fat 3·3 per cent., sugar 6·8 per cent., casein 1 per cent., albumin 0·5 per cent., and mineral matter 0·20 per cent. Cow's milk: Water 87·33 per cent., fat 3·75 per cent., sugar 4·75 per cent., casein 3·0 per cent., albumin 0·40 per cent., mineral matter 0·75 per cent. It will thus be seen that the composition of cow's milk and goat's milk is much the same, although goat's milk is superior as regards fat, which is an advantage. Human milk differs chiefly from goat's and cow's milk in that it contains a much smaller proportion of mineral salts and casein.

THE IRON-BACTERIA.

A VERY interesting article contributed by David Ellis, Ph.D., D.Sc., F.R.S.E., to the January number of *Science Progress* deals with those higher bacteria which are almost always to be found flourishing in ferruginous waters. As the organisms grow and multiply their mucilaginous outer membranes

become impregnated with brown ferric hydroxide. They have been termed iron-bacteria, though iron would not appear to be essential to their prosperity. When a microscopic examination is made of the red deposit which forms the bed of ferruginous springs it will generally be seen to consist of a multitudinous number of small hollow tubes. These are the sheaths built up by the organisms during their lifetime, which are left as memorials of their activities. The paper is full of interest as to the life-history of this group of organisms, but the section which from the hygienist's point of view claims more attention is that dealing with those iron-collecting organisms which appear and multiply sometimes in water-supplies and are the cause of a considerable nuisance. But there is no reason to think that these organisms possess any pathological significance. No poisonous excretions are liberated as a result of their growth, yet, as Dr. Ellis points out, they seriously inconvenience the engineer and give anxiety to others who are concerned to see their water reservoirs assume a sinister tint. When a certain, at present unknown, sum total of conditions holds, these organisms multiply at an extraordinary rate, and the water in a very short time takes on a disquieting rusty red colour. It would appear that these sudden rapid multiplications never last long because the organisms themselves probably make the water unfit for their continued existence. In the intervening period their activities resemble those of other water organisms, and it is possible at most seasons of the year to detect their presence by a diligent search in their haunts. One of the best examples quoted by Dr. Ellis occurred at Cheltenham in 1896, when the water supplied to the town became red, turbid, and developed an offensive odour. Within a fortnight the filters had become clogged. This state of affairs continued for about six weeks, after which the water once more began to assume its normal appearance. There was no evidence to show that this rapid growth of the iron-organism had any pathological significance. The culprit in this instance was the iron-assimilating organism known as *Crenothrix polyspora*. The same inconvenience has occurred in London, Berlin, Lille, Rotterdam, and elsewhere. Dr. Ellis points out that the absorption of iron compounds is not essential to the growth of these organisms, since artificial cultivations can be made from which the iron has been rigorously excluded. But it is suggested that these iron-bacteria by their peculiar action may in the past have been the builders of rocks composed of ferruginous stone.

THE STERILISATION OF WATER BY ULTRA-VIOLET RAYS.

THE sterilisation of water by means of the ultra-violet rays from a quartz mercury lamp has been carried out on a large scale in France with some success. An account of certain of the early experiments appeared in THE LANCET five years ago.[1] At first many difficulties were encountered, the chief one being to get the water completely exposed. Even minute traces of suspended matter present or turbidity prevented sterilisation, and the method was not effective until the water was first filtered bright. In a very exhaustive series of trials, the results of which are published in the Thirty-third Annual Report of the Provincial Board of Health of Ontario just issued, Mr. N. F. Parkinson, M.A.Sc., reports favourably on the ultra-violet-ray treatment of water, and he regards his researches as proving that given certain conditions, which can easily be controlled, the results are satisfactory and reliable. He emphasises the importance of steadiness of treatment. The requirements for a constantly good effluent are that the lamp be burning under a constant voltage, and that the lamp itself be in a good condition. The treatment of turbid water has received particular attention. By means of a system of baffles adjusted according to requirements the sterilising plant was brought to a high state of efficiency. Thus, in one case where a water showed a turbidity of 20 parts per million (American Public Health standard) the removal of bacteria was well over 99 per cent. With a turbidity of 30 and a direct path between the initial and final exposure—that is to say, with the horizontal baffles entirely removed—the removal was 97·5 per cent. and 98·4 per cent. as regards the bacteria growing at temperatures of 18·2° C. and 37·5° C. respectively. These researches are of great importance, since the method promises to provide a simple and expeditious way of sterilising water-supplies and to render chemical treatment unnecessary. The action of the ultra-violet rays appears to be entirely physical, and it is very rapid. It was at first surmised that the destruction of bacteria was due to the formation of ozone or of hydrogen peroxide in the water, but this does not appear to be the case, since only a trace of such substances is formed after some hours, while the sterilisation requires only a short exposure.

[1] THE LANCET, Dec. 17th, 1910, p. 1784.

IN selecting names for the appeal tribunals under the Military Service Act, 1916, Mr. Walter Long recommends the mayors and chairmen of county councils to take care to choose persons of judicial and unprejudiced mind and temperament. He considers that a fair proportion of the members of the tribunal should be direct representatives of labour, that at least one member should have had some legal training and experience, and that women may be placed upon tribunals with advantage. The appointment of the appeal tribunal rests with the Crown.

THE Annual Oration of the Hunterian Society will be delivered by Dr. A. S. Currie, at 1, Wimpole-street, W., on Wednesday, Feb. 9th, at 9 P.M., the subject being "The Spirit and Inspiration of William and John Hunter."

THE death occurred on Feb. 1st of Lieutenant-Colonel Stanley Boyd, R.A.M.C. (T.), surgeon to Charing Cross Hospital.

WE regret also to record the death of Colonel Charles Stonham, C.M.G., senior surgeon to the Westminster Hospital, after an illness contracted while consulting surgeon with the forces in Egypt.

THE ninety-fourth annual meeting of the subscribers to the Plymouth Royal Eye Infirmary was held on Jan. 19th. The medical report stated that during 1915, 2319 patients were treated, and this was a larger number than in the preceding year. The financial statement showed an income of £1557, and a favourable balance of £126 remaining at the close of the year.

A NEW COMBINED PHYSICAL TREATMENT FOR WOUNDED AND DISABLED SOLDIERS.

(HEAT, MASSAGE, ELECTRICITY, MOVEMENTS.)

BY R. FORTESCUE FOX, M.D. LOND., M.R.C.P. LOND.,
AND
J. CAMPBELL MCCLURE, M.D. GLASG.,
HONORARY SECRETARIES TO A COMMITTEE OF THE SECTION OF BALNEOLOGY AND CLIMATOLOGY OF THE ROYAL SOCIETY OF MEDICINE.

WE submit the following account, including, so far as possible, the results obtained by a new combined physical treatment for wounded and disabled soldiers, comprising heat, massage, electricity, and movements, as employed at the Hôpital Complémentaire at the Grand Palais in Paris. The facts have been supplied to a Committee of the Section of Balneology and Climatology of the Royal Society of Medicine.

Personnel of Committee.—The committee was appointed in January, 1915, to circulate information, and to advise the army medical authorities in the treatment of wounded and invalid soldiers by baths and associated methods at the British health resorts. It includes, amongst others, Dr. Frederick Taylor, President of the Royal Society of Medicine; Sir Lauder Brunton, Surgeon-General Russell, Dr. Leonard Williams, Dr. S. D. Clippingdale, Dr. Neville Wood, Dr. F. Parkes Weber, Mr. Charters Symonds, and Dr. S. P. Sunderland (chairman). Early in the following summer the committee was informed that a new combination of baths and exercises was being used for wounded soldiers at a hospital for physical treatment which had been opened at the Grand Palais. One of the secretaries accordingly went to Paris on behalf of the committee, and there found in operation a hydrological method, which, associated with massage and movements, was giving good results in limbs disabled by gunshot wounds.

Elements of the treatment.—The Grand Palais was converted into a large hospital for physical treatment in January, 1915. It contains departments for hydrotherapy, massage, radiology, and electro-therapy, and lastly for mechanical treatment by Zander apparatus. The number of beds was at first small, but is now 2400. In June an annexe was opened where soldiers, chiefly officers from all parts of Paris, are treated as out-patients. The separate departments of the Palais are under expert medical direction, and the annexe has been placed under an experienced hydrologist from one of the French spas. It is recognised that physical treatment in its various forms gives better results for in-patients than for out-patients. In many cases it must be applied daily for weeks or months, and this is for obvious reasons difficult for out-patient soldiers, and in addition to the treatment itself the residence in and "atmosphere" of a convalescent hospital is favourable to recovery. At the same time out-patients have been treated in Paris with much success, particularly officers, and an out-patient department seems more appropriate for them than for privates.

Heat, massage, movements, and electricity are familiar things. What is new is the scope of their application in military practice, and the methods by which they are combined. A few observations upon the ordinary use of these physical agencies may not be out of place. *Heat*, dry and moist, has been always applied locally to limbs crippled by arthritis or injury. All the usual methods, from the apparatus of Tallerman and the "thermal air chamber" to those of Bier and Greville, Dowsing and Tyrnauer, have for their object the local application of dry heat. The drier the heat the higher the temperature that can be employed. On the other hand, the sedative and emollient effects of moist heat have been sought by means of warm baths, by local applications of vapour and by gentle douches, for the ordinary douche is inappropriate when a sedative effect is required. It has been well said regarding the medical application of heat that no remedy requires more care, method, and moderation in its use. In one aspect it resembles massage, passive movements, and electricity, because all of them introduce into the body energy from an external source. *Massage* has always been, and never more so than at present, a standing prescription for stiffness of joints and muscles, but, like heat, it is a two-edged tool. It is now generally recognised that swollen and sub-inflammatory conditions both of the joints and soft tissues may be either relieved or aggravated by manipulation, according to the method employed and the accessory treatment. For example, dry massage on an unprepared limb is one thing. It is quite another thing when associated with moisture and heat, as in the sedative douche-massage, or after preparation of the limb in local hyperthermal baths, as at the Grand Palais. *Movements*, both active and passive, are widely employed in British military practice for re-education of muscles and mobilisation of joints. The manual school has hitherto predominated, preferring with some reason the *tactus eruditus* to any machine. The mechanical school, to which the French incline, advocate *les appareils* of Zander. Both aim to give to the affected muscles and joints mechanical movements, active or passive, within prescribed limits. Good work for disabled soldiers has been already done by mechanical means in England, and we may mention that of Dr. Gustav Hamel in London and the Edgar Allen Institute in Sheffield. The effect of preparation by heat and moisture is illustrated by an old observation at Bath, where it has been found for many years past that a stiff limb, otherwise intractable, could often be mobilised with comparative ease and without pain when the patient was immersed for some time in the deep thermal bath. The value of the practice at the Grand Palais Hospital consists, therefore, not in the novelty of the elements employed, but in the skilful adaptation and combination of physical agencies in dealing with the effects of wounds. By associated and successive treatments, daily repeated—including heat, moisture, massage, electricity, and movement—it is claimed that a different and more lasting effect is produced than can be obtained, either by the same agencies singly or by any other form of treatment.

The departments at the Grand Palais.—Local hot air baths (thermotherapy), ranging in temperature from 50° to 80° C., and of 15 to 20 minutes' duration, are often used for injuries of the shoulder, as a first or preparatory treatment. In cases of complicated fracture, with chronic periostitis and pain on pressure or movement, it is claimed that heat in this form promotes absorption of inflammatory products, and so prepares the joint for mobilisation. Electric radiation baths are also used in the same class of cases.

Local hydrological treatment is employed in a special manner for wounded limbs, especially for trophic lesions resulting from prolonged suppuration, chronic œdemas, swellings of the periarticular tissues, and fractures of the articular ends of bones, and painful and adherent cicatrices. Such applications prepare the way for massage and movements, and render them easier and less painful. The arm or leg is placed in a local bath of running water (*balnéation à l'eau courante*). The temperature is hyperthermal, ranging from 40° to 46° C. and gradually increasing, and the duration from 20 to 30 minutes. The current is rotatory, of a strength that can be varied at will, and it can also be directed to any part of the limb. Such applications produce extreme vaso-dilatation and increased arterial circulation. In addition to these familiar effects, which are well seen in the treatment of stiffness and fatigue fever by hyperthermal baths, it is believed that "whirl baths," as they may be called, have a special action due to the movement of the water. The hydro-massage, added to their high temperature, appears to have a marked sedative effect in relieving pain, and also promotes the lymph circulation and diminishes the effusions and swellings of soft parts. This form of bath therefore accelerates the retrogression of subinflammatory conditions. The same effects are not observed from baths of similar temperature in still water. Whirl baths are now always given before manual or mechanical treatment, and increasing importance is attached to them. At the annexe in five months 2124 preparatory treatments in *eau courante* were given.

Massage and mobilisation.—After the *eau courante* bath the limb in most cases but not all is subjected to massage. Manual treatment is usually given before mechanical, especially short applications of vibratory massage, and is always gentle and progressive in character. The muscular spasm and stiffness of the injured limb having been allayed by the

preparatory treatment just described, and the circulation being increased and accelerated, massage can now be administered without pain, and promotes the removal of deposits and effusions and the nutrition of wasted muscles. The first movement (mobilisation of joints or muscles) is nearly or entirely *passive*. This may be effected either by the hand or by means of apparatus, and in either case is exactly adapted to the particular disablement (defect of flexion, extension, rotation, supination, &c.). Whilst the hand is held to be competent for large numbers of cases, there seems to be considerable scope for mechanical appliances in military practice. Moreover, the apparatus is capable of measuring the amplitude of movements and the resistance overcome, as well as of recording the results of treatment. Where the applications are given daily for many weeks this is often a matter of importance. The object of mechanotherapy is stated by the French physicians to be not only the mobilisation of joints but the re-education of muscular movements. It is held to be beneficial after wounds of all kinds, whether articular, periarticular or muscular, or lesions of nerves. In each case the prescription is detailed and defined, and gives the registered number of the apparatus and the duration and frequency of treatment. The intention is to give the maximum of movement combined with the minimum of fatigue. The movements given with heavy weights do not give the best results. It is important to determine the *order* in which the several apparatus should be used, and many are often used in succession. Fatigue lessens the good results, and the application should be discontinued at the point when movement becomes painful. Where the muscle is contracted pain often accompanies its slightest movement, and patience and the goodwill of the wounded are necessary. It is found that muscular weakness, whether functional or resulting from articular or osseous lesions, is equally benefited by gradual mobilisation. The ideal is the complete re-education of lost movements and the restoration of muscular tone and contractility.

Electricity.—The department for the electrical treatment of military cases is the most important centre of electrotherapy in Paris, both as regards the installation and the number of wounded who are treated. It has a capacity for 800 treatments per day. In each case a complete electrodiagnostic examination is made, to which great importance is rightly attached. The majority of cases dealt with are wounds of nerves and muscles, neuritis, neuralgia, paralysis, and traumatic neuroses. The electrical phenomena following upon division of nerves and their suture have been especially studied.

Working of the Grand Palais Service.—Records.—The Grand Palais is reserved mainly for in-patients, the annexe for out-patients, and especially officers. New patients are received and examined twice in the week. The medical officers determine at the outset for each case (1) the diagnosis; (2) the degree of incapacity for work, both as regards the injured limb and generally. This is stated as a percentage according to a War Office standard, in which the normal is represented as 100, and serves as a basis for subsequent records of incapacity. The final result is also stated as a percentage figure. The treatments given in each department are entered day by day for each patient on a case record card, headed *Gouvernement Militaire de Paris, Service de Physiothérapie.* Upon this card the diagnosis and particulars are recorded, and on the reverse side, in a tabular form, the daily treatments.

Results obtained in relief of disablement.—The physical methods above described are found to be applicable, and to produce "appreciable results," in all sequelæ of wounds. For many cases a complete restoration of function has been obtained, and where this is impossible the figure of incapacity has been considerably reduced, indicating a partial cure of disablement and a substantial economy to the State. Moreover, experience shows that the results are always better in recent cases than in those that have waited long for treatment. The cases completely cured are stated to form 51 per cent. of the whole number treated. "The statistics," says Dr. Quiserne, Medical Director of the Annexe in the Rue d'Artois, "show more remarkably than any report the necessity of furnishing to the wounded a rapid and complete method of cure by the rational and systematic employment of physical methods."

The authors of the report are informed that in one month alone (October, 1915) the number of disabled men returned to active service was 452; that this would effect a saving to the State on account of pensions of about £80,000, and that on the total number of wounded the average reduction of incapacity was more than 20 per cent. The objects that have inspired the founders of this great hospital for physical treatment in Paris are stated to be as follows:—1. To prevent the after-effects of wounds. 2. To restore useful soldiers to the army in the shortest possible time. 3. For men who cannot be completely cured to limit the disablement of limbs, and so to preserve as far as may be their capacity for work in the future. 4. At the same time to effect an economy to the State by diminishing the cost of pensions.

In preparing the report the authors acknowledge the help of Dr. Jean Camus, the Director of Physiotherapy at the Grand Palais, Dr. Quiserne, Dr. A. Martinet, the British Ambassador, and the correspondent of *The Times* in Paris.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.

MEETING OF COMITIA.

A COMITIA was held on Jan. 27th, Dr. FREDERICK TAYLOR, the President, being in the chair.

The following having passed the required examination were admitted Members of the College: Professor Aldo Castellani and Dr. John Lloyd Davies.

Licences to practise physic were granted to 80 candidates who had passed the necessary examinations.

Conjointly with the Royal College of Surgeons of England, Diplomas in Public Health were granted to the following candidates: Mr. Ratonjee Dinshaw Dalal, Dr. Philip Hamill, Dr. William John Hart, and Dr. Horace Richard Wilson.

The following communications were received: 1. From the secretary of the Royal College of Surgeons of England reporting proceedings of the Council of that College on Nov. 11th, Dec. 9th, 1915, and Jan. 18th, respectively. 2. From the matron-in-chief to the Joint War Committee of the British Red Cross Society and the Order of St. John of Jerusalem in England, containing a letter from the chairman of the said committee, dated Dec. 30th, 1915, proposing to found a college of nursing

Sir DYCE DUCKWORTH, the treasurer, moved, and Dr. SIDNEY MARTIN, the junior censor, seconded:—

That a letter of condolence be sent to Mrs. George Oliver expressing the great regret of the College on the occasion of the death of her husband, a distinguished Fellow, who founded and generously endowed the Oliver-Sharpey lectures in the College in 1904.

The resolution was adopted.

A report was received and adopted from the committee of management dated Dec. 7th, 1915. The report was as follows:—

1. The committee recommend: (*a*) That the following institutions which have been visited by a member of the committee and reported as fulfilling the requirements of the Board be added to the list of institutions recognised by the Examining Board in England for instruction in chemistry and physics: Sir Roger Manwood's Grammar School, Sandwich; Wellington College. (*b*) That the following institution which is already recognised for instruction in chemistry and physics be recognised also for instruction in biology: the Technical College, Swansea.

2. The attention of the committee has been drawn to the fact that students may now matriculate at the Universities of Manchester, Liverpool, Leeds, Sheffield, and Birmingham without passing in Latin. There is no reason to believe that the standard of the examination for matriculation at these Universities has been in any way reduced, but a wider choice of subjects is now allowed to the student. The principle of recognising the matriculation examination of a University without Latin was adopted by the Royal Colleges in the case of the University of London on the recommendation of the committee of management in June, 1902, and the committee now recommend that this recognition be extended to the matriculation examination of the Universities mentioned.

The PRESIDENT announced that he had appointed Sir Thomas Barlow, Bart., K.C.V.O., to be the Harveian Orator for 1916, and Dr. Hector W. G. Mackenzie to be

the Bradshaw Lecturer. Also that the Council had nominated Dr. W. J. Howarth, medical officer to the City of London, to the Milroy Lecturership for 1917.

Dr. F. J. Wethered, Dr. J. Calvert, Dr. J. Galloway, and Dr. C. Ogle were elected Councillors.

Sir Francis Champneys was elected a Representative of the College on the Central Midwives Board for one year, dating from April 1st next.

Medical Practitioners and Criminal Abortion.

A supplementary report was received and adopted from the Censors' Board upon the duties of medical practitioners in relation to cases of criminal abortion. The report (together with an explanatory note and counsel's opinion) was as follows:—

It will be remembered that on July 15th, 1915, the College adopted a report from the Censors' Board containing —(*a*) opinions on the duties of medical practitioners in relation to cases of criminal abortion; (*b*) certain legal advice concerning the legal responsibilities of the practitioner and concerning the methods by which the statement of a patient, who consents to give evidence, may be taken from her. It was further decided that a copy of the opinions so formulated, with the legal advice appended, should be sent to the Public Prosecutor, the Royal College of Surgeons, the General Medical Council, and the medical press. This was accordingly done. But since the Public Prosecutor took exception to some of the legal advice the clauses containing it were withdrawn from publication in the medical press, and the College of Surgeons and the General Medical Council were asked to disregard them till the College should have obtained further legal opinion.

The President and Censors, in accordance with a resolution of the College (July 29th, 1915), have obtained the opinion of Mr. R D. Muir on these clauses, and have submitted them in their altered form to the Public Prosecutor, who states that, in this form, they have his complete approval.

The President and Censors now recommend that the opinions of the College (as previously published), and the legal advice as now obtained, should be printed and sent to the Public Prosecutor, the Royal College of Surgeons, the General Medical Council, and the medical press in the form enclosed.

Jan. 7th, 1916. FREDERICK TAYLOR, President.

(1) *Resolutions concerning the Duties of Medical Practitioners in Relation to Cases of Criminal Abortion.*

The College is of opinion—

1. That a moral obligation rests upon every medical practitioner to respect the confidence of his patient; and that without her consent he is not justified in disclosing information obtained in the course of his professional attendance on her.

2. That every medical practitioner who is convinced that criminal abortion has been practised on his patient, should urge her, especially when she is likely to die, to make a statement which may be taken as evidence against the person who has performed the operation, provided always that her chances of recovery are not thereby prejudiced.

3. That in the event of her refusal to make such a statement, he is under no legal obligation (so the College is advised) to take further action, but he should continue to attend the patient to the best of his ability.

4. That before taking any action which may lead to legal proceedings a medical practitioner will be wise to obtain the best medical and legal advice available, both to ensure that the patient's statement may have value as legal evidence and to safeguard his own interests, since in the present state of the law there is no certainty that he will be protected against subsequent litigation.

5. That if the patient should die he should refuse to give a certificate of the cause of death and should communicate with the coroner.

The College has been advised to the following effect:—

1. That the medical practitioner is under no legal obligation either to urge the patient to make a statement, or, if she refuses to do so, to take any further action.

2. That when a patient who is dangerously ill consents to give evidence her statement may be taken in one of the following ways:—

(*a*) A magistrate may visit her to receive her deposition on oath or affirmation. Even if criminal proceedings have not already been instituted, her deposition will be admissible in evidence in the event of her death provided that reasonable written notice of the intention to take her statement was served on the accused person and he or his legal adviser had full opportunity of cross-examining.

(*b*) If the patient has an unqualified belief that she will shortly die, and only in these circumstances, her dying declaration will be admissible. Such a declaration may be made to the medical practitioner, or to any other person. It need not be in writing, and if reduced into writing it need not be signed by the patient nor witnessed by any other person, though it is desirable that both should be done, or that, if the patient is unable to sign, she should make her mark. If possible, the declaration should be in the actual words of the patient, and if questions are put, the questions and answers should both be given, but this is not essential If the declaration cannot there and then be reduced into writing, it is desirable that the person to whom it is made should make a complete note of it as soon as possible.

January 27th, 1916

(2) *Counsel's Opinion.* Ex parte *The Royal College of Physicians* Re *Dying Declarations.*

1. I think it best, before answering the question on which I am asked to advise, to state shortly the law as to the admissibility in evidence of statements made by deceased persons.

2. Under 11 and 12 Vict. c. 42 (Indictable Offences Act 1848) sec. 17 on the trial of a person for an indictable offence the deposition of a dead person is admissible, if taken before a Justice of the Peace (before the accused was sent for trial) in the presence of the accused, provided that he or his counsel or solicitor had full opportunity of cross-examining the witness.

3. The effect of section 6 of the Criminal Law Amendment Act 1867 (30 and 31 Vict. c. 35) is that in the case of a woman who is dangerously ill and in the opinion of a medical practitioner not likely to recover, a Justice of the Peace may take from her a statement on oath or affirmation relating to an indictable offence. In the event of her death, her deposition will be admissible in evidence on the trial of the offence to which it relates, if a reasonable notice in writing of the intention to take her statement was served on the accused, and he, or his counsel or solicitor, had (or might have had if he had chosen to be present) full opportunity to cross-examine the deceased. It is not necessary under this provision, as it is under the Act of 1848, that criminal proceedings shall already have been instituted at the time when the statement was taken.

4. The only other relevant case in which a statement made by a deceased person can be given in evidence on a criminal trial is when the trial is for the murder or manslaughter of that deceased person and the statement is what is known as a "dying declaration"; i.e., the statement will be admissible to prove the circumstances of the crime, provided that it was made in a "settled hopeless expectation of death" not necessarily at once, but within a very short time. R. *v.* Perry (1909) 2 K.B. 697.

5. The statement need not be written, nor if written need it be signed by the person making it, but it is desirable that if the circumstances permit it shall be put into writing and signed by the declarant, or that if unable to sign she should make her mark. I agree that, although the statement if put into writing need not be witnessed, it is desirable that this should be done. It has been ruled that in order to be admissible the declaration must be in the actual words of the deceased, and if questions are put the questions and answers must both be given, in order that it may appear how much was suggested by the questioner and how much the production of the person making the declaration. Reg. *v.* Mitchell, 17 Cox 503. No doubt this is desirable, but I do not think it is essential. See Phipson on Evidence, 5th edition, p. 301.

6. If the statement was not reduced into writing at the time when it was made, it is desirable that the person to whom it was made should make a full note of it as soon as possible, to enable him to refresh his memory by it, if he has to give evidence.

7. That being in my opinion the law, I advise that paragraph 2 in the summary of the law at the end of the circular submitted to me be recast in the following way:—

In the first line substitute "dangerously ill" for "seriously ill." For (*a*) substitute

"A magistrate may visit her to receive her deposition on oath or affirmation. Even if criminal proceedings have not already been instituted her deposition will be admissible in evidence in the event of her death provided that reasonable written notice of the intention to take her statement was served on the accused person and he or his legal adviser had full opportunity of cross-examining."

Omit (*b*). For (*c*) substitute

"If the patient has an unqualified belief that she will shortly die, and only in these circumstances, her dying declaration will be admissible. Such a declaration may be made to the medical practitioner, or to any other person. It need not be in writing, and if reduced into writing it need not be signed by the patient nor witnessed by any other person, though it is desirable that both should be done, or that if the patient is unable to sign she should make her mark. If possible the declaration should be in the actual words of the patient, and if questions are put the questions and answers should both be given, but this is not essential. If the declaration cannot there and then be reduced into writing, it is desirable that the person to whom it is made should make a complete note of it as soon as possible. RICHD. D. MUIR.

3, Temple Gardens, Temple, E.C., 10th September, 1915.

REPORTS OF THE YELLOW FEVER COMMISSION.

EARLY in 1913 the Colonial Office appointed a Commission of experts to study the nature and relative frequency of the fevers occurring among Europeans, natives, and others in West Africa, with special reference to yellow fever and its minor manifestations in that region. This Commission has already presented two reports,[1] and a third is in course of preparation. Investigations have been carried out in the field, as well as in the laboratory, during the past three years, and some of the results of these inquiries are now published in two supplementary volumes[2] which together comprise 752 pages of printed matter along with 235 charts, 19 plates, as well as 10 plans and maps. Some of the reports are supplied by the investigators working under the direction of the Commission and others by unofficial medical men who have been associated in one or another way with the inquiries.

[1] THE LANCET, Jan. 23rd, 1915, p. 196.

[2] These volumes are published by the University Press of Liverpool as Yellow Fever Bureau Bulletin Supplements, the price of each volume being 25*s.* net.

In a preface the Commissioners are careful to state clearly that they accept no responsibility for the views set out in the various reports by these workers. They express the opinion, however, that the results of the researches, many of which were carried out under circumstances of considerable difficulty, should be placed on record, not only to commemorate the painstaking efforts of the various investigators, but also because they may prove useful and form a basis for criticism and discussion; in this way they may assist in the solution of the problems which still confront those who in their administrative duties are brought into contact with yellow fever.

First Supplementary Volume.

More than half of the first supplementary volume is occupied by a series of four reports on yellow fever in Nigeria during 1913, contributed by Dr. E. J. Wyler, of the West African Medical Staff, dealing respectively with outbreaks of the disease at Lagos and Abeokuta, the occurrence of cases on board ships and in the central province. Mr. T. M. Russell Leonard, resident medical officer at Lagos Hospital, supplies details of the incidence of yellow fever at Lagos in 1913 and the early part of 1914, describing the clinical and pathological characters of the malady observed by him. A short account of a visit to Guayaquil, undertaken with a view of studying yellow fever at that place, is furnished by Mr. J. M. O'Brien, of the West African Medical Staff.

Second Supplementary Volume.

In the second supplementary volume Lieutenant-Colonel J. C. B. Statham, R.A.M.C., sanitary officer of Sierra Leone, contributes details of a series of 800 medical pyrexias investigated on behalf of the Commission in Sierra Leone from May to September, 1913, with the inclusion of a further 300 cases which he had inquired into before the formation of the Commission. Malaria would appear to be the overwhelmingly predominant fever of Sierra Leone, since it accounts for three-quarters of all the fever cases observed. Though in the 12 months ended October, 1913, Colonel Statham did not recognise a single case of yellow fever while working at Freetown, he admits that it is possible that he may have overlooked the disease in its milder forms which are unrecognisable clinically or by blood tests. Dr. G. G. Butler, of the West African Medical Staff, gives a general summary of the work undertaken by him at Freetown from May to September, 1913, during part of which time he collaborated with Colonel Statham. Dr. Harald Seidelin presents a summary of his investigations, undertaken under the Commission from August, 1913, to January, 1914, in which he reports that he carried on the yellow fever infection through a practically unlimited number of guinea-pigs, in the blood and organs of which he demonstrated the presence of paraplasma flavigenum, and observed some hitherto unknown forms of the parasite. This observer, in conjunction with Dr. Andrew Connal, director of the Medical Research Institute, Yaba, Lagos, contributes another report on experimental yellow fever in laboratory animals, illustrated with coloured plates and a number of tables and charts. Dr. Seidelin also supplies a further report on experimental transmission of paraplasma flavigenum on animals brought from Nigeria to this country; and he furnishes yet another report dealing with some histological lesions observed in laboratory animals infected with yellow fever, illustrated with several coloured plates. Dr. D. Thomson gives an account of the examination of 25 normal guinea-pigs for the presence of "Seidelin bodies." He is of opinion that the majority of these are not of a protozoal nature, most of them being artefacts. A report on yellow fever investigation in Freetown from September, 1913, to March, 1914, is supplied by Dr. J. M. Dalziel and Dr. W. B. Johnson, both of the West African Medical Staff. Dr. G. E. H. Le Fanu, medical officer at Quittah, Gold Coast, furnishes a list of fever cases investigated during the months of March and April, 1914, and Dr. Connal jointly with Dr. J. E. L. Johnston contributes a paper on natural infections in guinea-pigs. A series of reports on the work of yellow fever investigation carried out in the Gold Coast Colony and the Northern Territories is presented by Dr. H. Sinclair Coghill and Mr. H. M. Hänschell, of the West African Medical Service; and Lieutenant-Colonel D. S. Harvey, R.A.M.C., reports on the examination of normal and inoculated guinea-pigs. This observer states that he found bodies resembling paraplasmata in the red cells both of normal and of inoculated animals. If the guinea-pigs were killed while feeding, the vessels of the stomach wall were found to be injected and a few small submucous hæmorrhages might be present. We gather that Colonel Harvey does not regard the paraplasma as the specific organism of yellow fever. Mention is made of a paper read before the Royal Society of Medicine in 1914, and which has already been published in the *Yellow Fever Bureau Bulletin*, by Dr. J. W. Scott Macfie and Dr. J. E. L. Johnston, entitled "Experiments and Observations on Yellow Fever." As this has already appeared in print it has not been reproduced, a note to this effect being inserted in the second supplementary volume.

THE SERVICES.

ROYAL NAVY MEDICAL SERVICE.

THE undermentioned have been entered as Surgeons for temporary service in His Majesty's Fleet:—P. C. Woolatt; I. H. Lloyd; C. Y. Eccles; C. E. Kindersley; H. S. Sington; F. L. Cassidi; G. F. V. Anson; H. F. McNally; and A. O. Courtis.

The following appointments have been notified:—Staff-Surgeon: S. H. Vickery to the *Victory*, additional, for disposal. Temporary Surgeons: J. Bostock to the *Vivid*, additional, for disposal; R. T. Bailey and H. S. Brown to Plymouth Hospital; D. M. P. Whitcombe and S. P. Mort to Haslar Hospital; and A. C. McAllister to Chatham Hospital.

ARMY MEDICAL SERVICE.

Colonel E. H. L. Lynden-Bell, C.B., is retained on the Active List, and to be supernumerary.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Majors to be temporary Lieutenant-Colonels whilst in command of field ambulances:—R. F. M. Fawcett; M. G. Winder; F. P. Lauder; W. J. S. Harvey; A. E. B. Wood; T. F. Ritchie; A. F. Carlyon; D. Ahern; S. E. Lewis; C. R. L. Ronayne; J. W. Jennings, D.S.O., retired; C. Bramhall; Temporary Major E. L. Gowland; J. E. Powell; D. P. Watson; B. H. V. Dunbar; M. G. Beatty; A. A. Meaden; Surgeon-Major W. S. Henderson, King Edward's Horse (The King's Oversea Dominions Regiment); W. Wiley; A. B. Hinde, Reserve of Officers; Temporary Major E. B. Pooley; Temporary Major A. N. Walker; H. B. Kelly; H. A. Davidson; J. H. Brunskill; A. C. Osburn; A. R. C. Parsons; R. Storrs; H. E. J. A. Howley; and A. S. Arthur.

The undermentioned Captains to be temporary Majors whilst in command of field ambulances: P. Sampson and E. M. O'Neill.

C. H. Milburn to be temporary Honorary Major whilst serving with No. 2 British Red Cross Hospital.

Temporary Captain R. S. Berry relinquishes his commission.

The undermentioned temporary Lieutenants to be temporary Captains:—L. P. Costobadie, J. Hanson, W. E. Adam, F. Paine, D. H. Paul, R. H. Fletcher, and J. I. O'Sullivan.

The undermentioned to be temporary Captains:—Temporary honorary Captain B. C. Mayberry, W. E. James, H. B. German (late Surgeon, R.N.), and H. D. Gillies.

The undermentioned to be temporary Lieutenants:—H. W. Evans, A. C. Wilson, H. G. R. Jamieson, W. Hughes, R. L. Blenkhorn, H. W. Parrott, H. C. T. Langdon, W. D. Kennedy, R. W. L. Fernandes, A. S. L. Malcolm, R. A. R. Green, P. A. Reckless, C. G. Sherowitz, G. J. Jones, A. Hendry, S. J. C. Fraser, T. Winning, C. E. Molino, D. Burns, I. Feldman, E. R. Hart, S. A. W. Munro, F. D. Crew, D. H. Hall, J. J. O'Neill, G. F. Palmer, L. W. Oliver, W. Stevenson, D. Lees, G. P. White, A. L. Singer, I. J. Balkin, R. M. Rowe, W. Brownlie, R. Johnson, J. A. Robinson, T. Dowzer, E. G. Pringle, and J. Potter.

The undermentioned relinquish their temporary honorary commissions on ceasing to serve with the St. John Ambulance Brigade Hospital:—Captain F. W. Goyder. Lieutenants: W. R. Mason, H. de L. Crawford, and A. C. McAlister.

The undermentioned to be temporary Honorary Lieutenants whilst serving with the St. John Ambulance Brigade Hospital:—S. A. Henry, C. E. S. Jackson, and W. Wilson.

Temporary Lieutenants D. J. McAdam and C. R. Lucas relinquish their commissions.

Temporary Lieutenant D. J. Miller relinquishes his commission on account of ill-health.

Canadian Army Medical Corps.

Major J. McCrae to be temporary Lieutenant-Colonel.

Lieutenants to be temporary Lieutenants: G. O. Scott and C. M. Scott.

SPECIAL RESERVE OF OFFICERS.

Royal Army Medical Corps.

Captain R. Magill to be temporary Major whilst in command of a field ambulance.

TERRITORIAL FORCE.

Royal Army Medical Corps.

Highland Field Ambulance: Lieutenant A. M. Baillie to be Captain. A. J. McIvor to be Lieutenant.

London Field Ambulance: Lieutenants T. A. Townsend and R. T. Caesar to be Captains.

Northumbrian Field Ambulance: Lieutenants F. J. B. Robson and C. G. Strachan to be Captains.

Northern General Hospital: The undermentioned Lieutenants to be Captains: W. Johnston, A. J. W. Stephen, R. A. Hooper, and G. F. Stones.

Southern General Hospital: Lieutenants H. C. H. Bracey and A. P. Thomson to be Captains.

West Lancashire Casualty Clearing Station: Lieutenant T. Aspinall and Lieutenant E. M. de Jong, from Attached to Units other than Medical Units, to be Lieutenants.

Wessex Field Ambulance: Major A. W. F. Sayres to be temporary Lieutenant-Colonel.

London (City of London) Sanitary Company: Captain C. C. Frye is seconded for duty under the Ministry of Munitions.

Highland Mounted Brigade Field Ambulance: Lieutenant (temporary Captain) A. F. Lee to be Captain.

East Lancashire Field Ambulance: J. Young to be Lieutenant.

Notts and Derby Mounted Brigade Field Ambulance: Lieutenant J. W. Rammell to be Captain.

Home Counties Field Ambulance: R. H. Hardwick to be Lieutenant.

London (City of London) Field Ambulance: Lieutenant W. R. H. Heddy to be Captain.

London Sanitary Company: The undermentioned Lieutenants to be Captains: J. O. W. Barratt, H. G. Moss, N. A. Dore, and J. Mair.

Attached to Units other than Medical Units.—To be Captains: Captain A. F. Lee (from Highland Mounted Brigade Field Ambulance), Lieutenant J. McGregor, Lieutenant T. P. Caverhill, Lieutenant A. G. Osborn, and Lieutenant T. W. Cole.

Inspector-General Belgrave Ninnis, C.V.O., R.N., has been promoted from Knight of Grace to Knight of Justice in the Order of the Hospital of St. John of Jerusalem in England.

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

IN the 96 English and Welsh towns with populations exceeding 50,000 persons at the last Census, 7867 births and 4860 deaths were registered during the week ended Saturday, Jan. 29th. The annual rate of mortality in these towns, which had been 14·3, 13·9, and 14·2 per 1000 in the three preceding weeks, fell in the week under notice to 14·0 per 1000 of their aggregate population, estimated at 18,136,180 persons at the middle of the year 1914. During the first four weeks of the current quarter the mean annual death-rate in these towns averaged 14·1, against a corresponding rate of 13·5 per 1000 in London. During the week the rate ranged from 5·0 in Blackpool, 5·7 in Acton and in Ilford, 6·0 in Grimsby, 7·5 in West Bromwich, and 7·7 in Oxford, to 19·7 in St. Helens, 20·6 in Barrow-in-Furness and in South Shields, 21·3 in Barnsley, 21·6 in Gloucester, and 22·2 in Dewsbury.

The 4860 deaths from all causes were 75 fewer than the number in the previous week, and included 314 which were referred to the principal epidemic diseases, against 329 and 305 in the two preceding weeks. Of these 314 deaths, 80 resulted from whooping-cough, 70 from diphtheria, 68 from infantile diarrhœal diseases, 62 from measles, 25 from scarlet fever, and 9 from enteric fever, but not one from small-pox. The mean annual death-rate from these diseases was equal to 0·9 per 1000, and coincided with that recorded in the previous week. The deaths attributed to whooping-cough, which had been 57, 78, and 74 in the three preceding weeks, rose to 80, and included 19 in London, 7 in Birmingham, 5 each in Liverpool and Manchester, 4 in Coventry, and 3 each in West Ham, Huddersfield, and Sheffield. The deaths referred to diphtheria, which had been 61, 84, and 79 in the three preceding weeks, fell to 70; 19 deaths were registered in London and 3 each in St. Helens, Preston, Bradford, Sheffield, and Leeds. The deaths of infants (under 2 years) from diarrhœa and enteritis, which had been 73, 60, and 60 in the three preceding weeks, rose to 68, of which 17 occurred in London, 4 in Middlesbrough, and 3 each in Leicester, Liverpool, and Manchester. The deaths attributed to measles, which had been 81, 75, and 73 in the three preceding weeks, further fell to 62, and included 8 each in London, Bristol, and Leicester, 7 in Leeds, 6 in Sheffield, and 4 in Burnley. The deaths referred to scarlet fever, which had been 30, 23, and 10 in the three preceding weeks, rose to 25, of which 6 were registered in London and 2 each in Coventry, Liverpool, St. Helens, Leeds, and Newcastle-on-Tyne. The fatal cases of enteric fever which had been 10, 9, and 9 in the three preceding weeks, were again 9 last week, and included 3 in Reading and 2 in Wigan.

The number of scarlet fever patients under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital, which had been 2325, 2224, and 2257 in the three preceding weeks, fell to 2189 on Saturday last; 260 new cases were admitted during the week, against 225, 244, and 286 in the three preceding weeks. These hospitals also contained on Saturday last 1503 cases of diphtheria, 109 of whooping-cough, 54 of measles, and 45 of enteric fever, but not one of small-pox. The 1203 deaths from all causes in London were 41 in excess of the number in the previous week, and corresponded to an annual death-rate of 13·9 per 1000. The deaths referred to diseases of the respiratory system, which had been 245, 264, and 254 in the three preceding weeks, fell to 231 in the week under notice, and were 219 below the number registered in the corresponding week of last year.

Of the 4860 deaths from all causes in the 96 towns, 178 resulted from violence and 367 were the subject of coroners' inquests, while 1487 occurred in public institutions. The causes of 46, or 0·9 per cent., of the total deaths were not certified either by a registered medical practitioner or by a coroner after inquest. All the causes of death were duly certified in Sheffield, Leeds, Bristol, West Ham, Bradford, Hull, and in 66 other smaller towns. Of the 46 uncertified causes, 9 were registered in Liverpool, 8 in Birmingham, 4 in Gateshead, and 2 each in London, St. Helens, Manchester, and Tynemouth.

HEALTH OF SCOTCH TOWNS.

In the 16 largest Scotch towns with an aggregate population estimated at 2,355,300 persons at the middle of this year, 1028 births and 658 deaths were registered during the week ended Saturday, Jan. 29th. The annual rate of mortality in these towns, which had declined from 17·4 to 14·4 per 1000 in the four preceding weeks, rose to 14·6 per 1000 in the week under notice. During the first four weeks of the current quarter the mean annual death-rate in these towns averaged 15·1, against 14·1 per 1000 in the large English towns. The annual rate last week ranged from 7·4 in Motherwell, 7·8 in Ayr, and 8·4 in Kilmarnock, to 21·5 in Greenock, 22·9 in Kirkcaldy, and 26·3 in Coatbridge.

The 658 deaths from all causes were 9 in excess of the number in the previous week, and included 59 which were referred to the principal epidemic diseases, against numbers declining from 72 to 43 in the three preceding weeks. Of these 59 deaths, 29 resulted from measles, 15 from diphtheria, 13 from infantile diarrhœal diseases, 7 from scarlet fever, 3 from whooping-cough, and 2 from enteric fever, but not one from small-pox. The mean annual rate from these diseases was equal to 1·5, against 0·9 per 1000 in the large English towns. The deaths attributed to measles, which had been 17, 23, and 19 in the three preceding weeks, rose to 29, and included 12 in Coatbridge, 9 in Glasgow, and 5 in Greenock. The deaths referred to diphtheria, which had been 19, 13, and 8 in the three preceding weeks, rose to 15, of which 6 occurred in Edinburgh, 3 in Glasgow, and 2 each in Perth and Kirkcaldy. The fatal cases of diarrhœa and enteritis (among infants under 2 years), which had been 10, 13, and 4 in the three preceding weeks, rose to 13; 6 deaths were registered in Glasgow and 2 each in Dundee and Aberdeen. The deaths attributed to scarlet fever, which had been 18, 11, and 9 in the three preceding weeks, further declined to 7, and comprised 2 each in Glasgow, Edinburgh, and Aberdeen, and 1 in Dundee. Of the 3 deaths from whooping-cough 2 were recorded in Glasgow and 1 in Kirkcaldy. The 2 fatal cases of enteric fever occurred in Glasgow.

The deaths referred to diseases of the respiratory system, which had steadily declined from 322 to 92 in the nine preceding weeks, rose to 97 in the week under notice, but were 175 below the number registered in the corresponding week of last year. The deaths from violence numbered 23, against 66 and 43 in the two preceding weeks.

THE annual meeting of the governors of the Bristol Eye Hospital was held on Jan. 18th, under the presidency of the Lord Mayor (Dr. Barclay Baron). The medical report stated that during 1915 the in-patients numbered 457. 9720 out-patients were treated, an increase of 389 compared with 1914. The financial statement showed an income of £2441, and a deficiency of £524 on the year's working.

Correspondence.

"Audi alteram partem."

SENIOR MEDICAL MEN AND NAVAL AND MILITARY SERVICE.

To the Editor of THE LANCET.

SIR,—I have recently received several letters from senior medical men who have retired from serving in the Indian Medical Service, the Colonies, &c., and who lament that at present no place can be found for them in the national service of the sick and wounded of our navy and army. These gentlemen have mostly occupied high positions; they possess great experience in medical and surgical diseases and injuries, and, although they have retired, still enjoy an amount of health and energy which might be placed at the disposal of the nation. From the most patriotic and laudable of motives, they chafe under the restrictions which prevent them from devoting their energies to the service of the country in connexion with the navy and army, while they naturally feel that these would be wasted were they, after the prominent positions which they have occupied and the exceptional experience which they have acquired, to adopt the only course which is available to them at present, that, namely, of offering to relieve general practitioners and panel doctors who have left to serve in the Royal Army Medical Corps.

It may be asked, Why do they not apply to the Central Medical War Committee, who are conferring on such subjects with the Director-General of the Army Medical Service? To this I would answer: That is the proper course to take, but not until it has been ascertained in what numbers and in what capacities these highly trained men are prepared to serve. Were this made certain, and were it evident that a considerable and valuable contingent were at the disposal of the nation, then the Central Medical War Committee should be approached in order that it might confer with the heads of the Navy and Army Medical Services, so as to discover in what manner and to what extent these men could be utilised, either now, or when coming events may have increased the strain on the physicians and surgeons of the country.

If any of those interested in this subject will communicate with me I shall be glad to have their suggestions, and perhaps arrange to have a meeting called, should the response to this letter seem to warrant it.—I am, Sir, yours faithfully,

ALEX. OGSTON,
President of the British Medical Association.
252, Union-street, Aberdeen, Jan. 30th, 1916.

SOLDIER'S HEART.

To the Editor of THE LANCET.

SIR,—In his letter in THE LANCET of Jan. 29th Dr. R. H. Trotter remarks that "no inconsiderable number of men with organically impaired hearts are being passed into the new armies," and he points out the desirability of the history of these cases being carefully investigated, lest they should conduce to those of "soldier's heart," recently dealt with in a paper by Sir James Mackenzie at the Royal Society of Medicine. There certainly is a considerable possibility of organically impaired hearts being accepted for military service at present, in view of the small importance attached by some, and notably by Sir James Mackenzie, to hearts manifesting evidences of mechanical imperfection by bruits or murmurs, which may be regarded by the examiner as physiological, but which are quite possibly permanent and organic lesions.

As Sir James Mackenzie has written a memorandum for the guidance of those examining recruits,[1] it would be interesting to learn more precisely from him what he considers a physiological or functional bruit as distinct from one denoting permanent mechanical lesion. The point is important and not dealt with in the memorandum referred to. In any case, we know he attributes little importance to valvular lesions as such. The criteria of the memorandum were criticised by some, among others by myself,[2] who, in the opinion of its author, had succeeded in "muddling" the matter, to use his own term,[3] and thereby, of course, like all muddled media, causing some obscurity of vision; but Sir James Mackenzie's chief exception was taken to an innocent contribution of Sir J. K. Fowler's in terms which left nothing to be desired in explicitness.[4] Sir J. K. Fowler's reply was a charming example of "heaping coals of fire" on the head of his assailant, who had "held him up to scorn." The episode would have been complete if the latter had confessed to having experienced some capital warmth in consequence. The more important point, however, in the present connexion is that in the paper in which he deals with Sir J. K. Fowler, Sir James Mackenzie relates a case of his own with a systolic apical bruit, in illustration of his theme, which passed through much exertion until invalided, unnecessarily in his opinion, by the military authorities. He regarded the bruit as "physiological." The history of the case shows that this sign was persistent and probably therefore organic, in the sense used by Dr. Trotter. It may appear presumptuous on my part to express that opinion, as I have not seen the case in question. But I have seen others which Sir James Mackenzie has considered negligible and which were unquestionably organic. It is this admission, without careful discrimination of the permanently damaged nature of these so-called functionally murmurous hearts, with a history of being able to endure strenuous exertion, which causes the admission of many of the organically affected hearts into the army, to which Dr. Trotter refers. I have at present under my care in the soldiers' wards of the Great Northern Central Hospital a young soldier who had been a footballer and, till the time of his enlistment, capable of lifting and moving heavy furniture without inconvenience, who broke down in route marching and now shows a largely dilated heart, with aortic regurgitation and Flint's murmur. All must have seen many similar cases, both aortic and mitral, invalided from a service to which they should never have belonged. On the other hand, cases occur, such as that mentioned by Sir James Mackenzie, if I may venture to regard it as having been organic, and also cases of the organic nature of which there can be no dispute, which endure much exertion without disaster. But they are exceptional. The cause of this difference is rather obscure, but it is rationally explicable in a measure. To try to do so here would be out of place. Valvular lesion in the youth is so often of rheumatic origin that the lesion may be said to carry with it the history which Dr. Trotter desiderates. In older men, if aortic and without rheumatic history, it is with considerable frequency of specific origin and

[1] Brit. Med. Jour., Oct. 16th, 1915.
[2] Ibid., Oct. 30th, 1915.
[3] Ibid., Dec. 4th, 1915. [4] Ibid.

indicative of vascular change. Both classes are very properly rejected by the examiner of recruits, or should be, whatever the functional capacity of the heart at the moment. With greater care in determining cardiac integrity in the recruit and exercising much scepticism as to the physiological nature of cardiac bruits, much trouble and expense may be avoided, and the efficiency of the soldier secured. The man invalided with the soldier's heart, properly so-called, may, of course, possess a perfectly sound organ, the heart being only one of the features of a general condition.

I am, Sir, yours faithfully,

ALEXANDER MORISON.

Upper Berkeley-street, W., Jan. 29th, 1916.

ON THE USE OF THE CLINICAL THERMOMETER.

To the Editor of THE LANCET.

SIR,—In THE LANCET of Jan. 22nd (p. 173) Professor Sims Woodhead and Dr. P. C. Varrier-Jones dismiss the claims of Galileo to the invention of thermometers rather summarily in a footnote, but I think these claims are supported by the fact that the Italian Government lent thermometers made by Galileo to the collection of scientific instruments shown in South Kensington in (I think) 1878, and I believe they are described in the catalogue, to which unfortunately I have at present no access.

In reference to the introduction of the thermometer into clinical practice in this country, my own recollections are definite. I held the appointment of house physician in the clinical wards of the Royal Infirmary of Edinburgh from October, 1866, to the end of July, 1867. These wards were for the teaching of clinical medicine to University students. The professors of clinical medicine were Dr. (afterwards Sir) Douglas Maclagan, Dr. Hughes Bennett, and Dr. Laycock, who each held office for three months. When I entered upon my duties as house physician I found, amongst other apparatus for use in the ward, a case containing two clinical thermometers, one straight and the other somewhat bent. Each was about ten inches or more in length and took about five minutes or more to reach the temperature of the body when it was placed in the axilla. This thermometer case I used to carry under my arm as one might carry a gun, and most of the thermometric readings I took myself, rarely entrusting the thermometers to the clinical clerks. The thermometers were known as Aitken's thermometers in the hospital. The clumsy character of these thermometers and the long time they took to rise prevented them from coming into general use, and it was only after their reduction in size, at Sir Clifford Allbutt's suggestion, that their use became common.

I am, Sir, yours faithfully,

LAUDER BRUNTON.

New Cavendish-street, W., Jan. 31st, 1916.

To the Editor of THE LANCET.

SIR,—I was ward clerk to Sir William Gull about 1864, who brought two long thermometers into the clinical wards and requested my colleague and me to take the temperature of some cases of typhus fever. This we did with these non-registering thermometers. We thus sat, for rather long periods, over the beds of the patients. In due course my colleague contracted the fever, and the use of the thermometers was discontinued for a time. Dr. Samuel Wilks examined in medicine at the University of London in 1867. I was a candidate, and there was a paper on the use of the thermometer in disease; after the examination Dr. Samuel Wilks spoke to me about the work of Wunderlich, and said only two of the candidates seemed to have read up the subject. This may interest your readers. I am, Sir, yours faithfully,

Devonshire-place, W., Jan. 28th, 1916. GEO. H. SAVAGE.

LYING-IN HOMES.

To the Editor of THE LANCET.

SIR,—I am obliged to you for publishing my letter of Jan. 4th and for so kindly taking the trouble to make a note with regard to it. It is perhaps unfortunate that all of us, "Fair Play," your annotator, and myself, referred to two matters in our first communications—viz., the question of notification of pregnancy and the supervision of lying-in homes. In my previous letter I tried to show that it was the second matter, that relating to lying-in homes, that interested me most. In "Fair Play's" mind and that of your annotator, and, it would now seem, also yours, the other, the notification of pregnancy, occupies the most important position. Personally, I take no exception to "Fair Play" or your annotator taking up the cudgels on behalf of the midwives in this connexion if they think it worth while. They may also be justified in attempting to induce medical practitioners to believe that they are in as great danger as midwives are being told they are. Probably the psychological moment for doing so had arrived, the "clamour" (the word is "Fair Play's") raised in the periodical catering for midwives having reached the stage when it might conveniently be brought before the medical practitioner in one of his periodicals.

These things may be so; I do not know. To my mind, however, neither the facts nor the claims of journalism justify "Fair Play" in attempting to help forward the campaign by suggesting that if local authorities are given duties that may bring them into contact with midwives, since her work will inevitably be mixed up with "nuisances" and "eating houses," loss of status will result to the certified midwife. "Fair Play" may be ignorant; the witnesses representing the midwives who appeared before the House of Lords Committee on behalf of the London County Council certainly were ignorant of the constitution of the public health staff employed by borough councils. There may be excuse for "Fair Play"; there might have been reasons for the ignorance of the witnesses referred to. It cannot, however, be ignorance of public health departments and of the medical officers of health, the representative officers of these departments, that induces you to partisan the London County Council against these departments and officers.

It must be that you are unaware of the objects aimed at in relation to the supervision of lying-in homes and of the reasons underlying the claims of the borough councils that they are capable of doing all that is necessary to attain these objects. In pressing their claims the councils aim no blow at the midwives or at the status of the certified midwife. They recognise that there are two classes of lying-in homes: one good and desirable, the other unsuitable, undesirable, and dangerous. In the former class is that conducted by the certified midwife to whom status means something; in the latter, that run by persons, generally without qualifications and commonly without morals or conscience.

My own experience of lying-in homes conducted by the certified practising midwife shows them to

be exceedingly well managed. The midwife proprietor seems to have no other desire than that her patient should do well and that, so far as the home is concerned, there should be nothing there likely to interfere with her chances of doing well. Such lying-in homes will be easy to supervise, and registration will amount to little more than a formality. The home that is not conducted on the lines that a well-qualified and capable midwife would adopt will not be easy to supervise. In all probability many of them will not be registered and will only be discovered after careful search. If they are registered they will have to be kept under close supervision. It is of such houses that borough councils are thinking when they press for the delegation of some of the powers granted in respect of lying-in homes. Their view is, and it seems to have common-sense behind it, that they have numerous opportunities and means of localising such places and of keeping them under observation. Births are notified to their medical officer of health and are visited on their behalf by the women on their public health staff. Their officers are well acquainted with the district and are visiting in it continually. What is to hinder them from keeping watch for and over undesirable premises? Linked up as the supervising body with the London County Council as the body responsible for registration, where is the difficulty in the way of the borough council of reporting with regard to unregistered premises or removals of persons who may not be considered above suspicion? Not only is there no difficulty in this or any other part of the work if it is entrusted to the borough councils; there is a complete absence of additional expense as well. The London County Council, on the other hand, cannot, without considerable additions to their staff, keep up anything like such a close supervision as the officers of the borough councils; geographically it is impossible. The London County Council admit that new officers will be necessary and every addition to the staff of that body means expense.

Rigid economy in your view is at the moment essential. It is your view also that the London County Council is the best qualified "to perform the task with economy without sacrificing efficiency." Where is the economy when additional county council officers are to be appointed to do work that borough council officers can perform as least as well? How possibly can a person who has to travel miles to supervise a house do it more efficiently than one who is practically at the door of the house? Possibly you were thinking more of the views expressed in your annotation with regard to notification of pregnancy, than of those in respect of lying-in homes, when you stated them to be substantially your own.

In this letter, as in that of Jan. 4th, my concern is mainly with the supervision of lying-in homes, and it is entirely in the interests of economy and efficiency that I regard it as advisable that the London County Council should delegate duties in connexion with the supervision of these places to the borough councils.

I am, Sir, yours faithfully,

CHARLES PORTER,
Medical Officer of Health, Metropolitan Borough of Marylebone.

Jan. 19th, 1916.

*** We do not plead guilty either to the ignorance or the partisanship attributed to us, and we think Dr. Porter does well in the beginning of his letter to admit the uncertainty of some of his inferences. With much of what he says all must agree.—ED. L.

FUNCTIONAL NERVOUS DISEASE.

To the Editor of THE LANCET.

SIR,—The evils, and they are great, of the now popular method of so-called "psycho-analysis" will not be abolished either by reiterating that they are evils, after the manner of Dr. R. Armstrong-Jones, or by rechristening the practice with the name of autognosis, as suggested by Dr. William Brown. Every doctor worthy of his salt must, in dealing with human patients, find out all he can about the mental state of them, and thus is an analyst of mind. But "psycho-analysis" as now understood is, as it were, a patent word, and connotes the assumption of unconscious mind. There is, therefore, no such broad distinction between the theory and method of this particular practice as Dr. Brown contends. Where would the autognosist be without the psycho-analyst sitting at his bed-head? And what would become of Freudism purged of psycho-analism? The theory is the egg from which the method came.—I am, Sir, yours faithfully,

H. BRYAN DONKIN.

Jan. 31st, 1916.

(*a*) INVERSION OF THE PELVIC BONES; AND (*b*) LONG-HEADS.

To the Editor of THE LANCET.

SIR,—(*a*) Dr. D. Berry Hart's memoir (see THE LANCET, Jan. 29th, p. 255) does not warrant the assumption that the inversion of the pelvic bones as a cause of trouble in the female is a pathological condition newly discovered by him. Dr. Douglas E. Derry, when working in the Medical School in Cairo, was the first to give an adequate explanation of the significance of the preauricular grooves in the female os innominatum; and both he and Professor F. Wood Jones called attention to cases in ancient Nubian skeletons where inversion of the pelvic bones was a cause of deformity. In several cases they found the fœtal head impacted in such pelves.

(*b*) On p. 254 of the same issue the statement occurs: "On the high authority of Ripley, Keith, Chalmers Mitchell, and others we now know that the dolichocephals or long-heads, coming originally from the northern shores of Africa, have encircled Europe to the north-west as far as Finland." I do not know what this eminent trio would think of the Finland reference of which they are accused, but it is surely ridiculous to attribute to them the rest of the statement, which has been one of the few generally accepted tenets of anthropology for the last 50 years.

I am, Sir, yours faithfully,

G. ELLIOT SMITH.

The University of Manchester, Jan. 31st, 1916.

FOOD ECONOMY IN WAR TIME.

To the Editor of THE LANCET.

SIR,—The rapid development of the work of the National Food Reform Association since the outbreak of war, and particularly the ever-increasing demand for practical instruction in war-time housekeeping and for literature, has rendered an increased staff and office equipment unavoidable. The call for help comes not only from individuals of all sorts and conditions, but from many influential organisations and local authorities. The association is also coöperating with the Parliamentary War Savings Committee and the Central Committee for National Patriotic Organisations.

Some 450 demonstration-lectures and meetings have been held during the 12 months ending Dec. 31st, 1915, while those already fixed for 1916 number close upon 150. A steadily increasing interest in our teaching on account of war-time conditions is reported. The audiences, ranging from a dozen to 2000 women of every section of the community—wage-earners, social workers, professional cooks, and mistresses of households—come to learn economy with increased efficiency, and show great enthusiasm about the practical nature of the lectures. We are now arranging about 20 such demonstrations a week—many of them courses—and could find openings for many more if we had a larger office staff. We feel justified, therefore, in appealing for an extension fund to meet present needs and to provide for inevitable developments, for while our membership is steadily growing and the receipts for sales of literature are daily increasing, we still need additional support to meet the unprecedented demands for our special war-time work.

We are confident that those who recognise the value of the educational and preventive work accomplished during the past eight years will rejoice at the national service the association is able to render at this crisis and will make a generous response. Help will be welcomed in any of the following ways:—

(*a*) Subscriptions or donations. (Cheques should be made payable to "National Food Reform Association" and crossed "Messrs. Barclay and Co., Ltd.")

(*b*) Orders for literature, especially for "Economical Dishes for Workers" (1*d*.), of which 50,000 copies have been called for during the war, "Hints Towards Diet Reform" (2*d*.), "Facts for Patriots," three series (3*d*. each), "Fireless Cookery" (1*d*.), "Our Children's Health at Home and at School" (5*s*.), and "Rearing an Imperial Race" (7*s*. 6*d*.).

(*c*) Offers to arrange for drawing-room meetings or demonstration-lectures, single or courses.

Yours faithfully,

MARGARET ASHTON.
HENRIETTA O. BARNETT.
LAUDER BRUNTON.
ROBERT HUTCHISON.
F. E. LACEY.
LEIGH.
LYTTON.
ISABEL MARGESSON.
GILBERT MURRAY.
WINIFRED PORTLAND.
HORACE PLUNKETT.
B. SEEBOHM ROWNTREE.
BEATRICE WEBB.
BASIL WILBERFORCE (Archdeacon of Westminster).
G. SIMS WOODHEAD.
H. BECKETT-OVERY (Acting Chairman).

National Food Reform Association,
Jan. 28th, 1916. 178, St. Stephen's House, Westminster.

EPSOM COLLEGE.

To the Editor of THE LANCET.

SIR,—My attention has been called to a special appeal for contributions to the Royal Medical Foundation attached to Epsom College from Sir Henry Morris.

As an old Epsomian now serving in the R.A.M.C. with the Salonika forces might I suggest that a special individual appeal in the form of a notice through the post be sent to all old Epsomians or the parents of such who are at present non-subscribers. I feel confident that the response would be satisfactory and that they would rally to the old "Coll." in this time of stress.

I am, Sir, yours faithfully,

Jan. 14th, 1916. O. E.

Obituary.

SIR FRANCIS HENRY LOVELL, C.M.G., LL.D., F.R.C.S. ENG.,

DEAN OF THE LONDON SCHOOL OF TROPICAL MEDICINE.

Sir Francis Henry Lovell, who died in London on Jan. 28th in his seventy-second year, was the son of the late Henry Hill Lovell, D.C.L. He was educated at St. Bartholomew's Hospital, becoming M.R.C.S. Eng. in 1865 and L.S.A. in 1867. From 1873 to 1878 he was colonial surgeon in Sierra Leone, and from then to 1893 chief medical officer and president of the general board of health of Mauritius, with a seat on the Legislative Council. From 1893 to 1901 he was surgeon-general and member of the Executive and Legislative Councils of the colonies of Trinidad and Tobago. In these appointments he showed high administrative qualities and, by the sanitary measures he introduced, contributed in no small degree to an improvement in the public health. In recognition of his good work he was appointed C.M.G. in 1893 and was knighted in 1900, just before his retirement from the colonial service. He then became attached as dean to the London School of Tropical Medicine.

A member of the staff writes: "Sir Francis Lovell had been in ill-health for some time, but this did not deter him from continuing to take a keen interest in the school and doing all he could for its advancement. His loss will be seriously felt, for he was by his courteous manners, kindly disposition, persuasiveness, and perseverance particularly successful in interesting others in the work of the school. During his deanship he visited Bombay, as well as the Eastern and Western colonies, and by his conference with the governors, administrators, and medical officers of these succeeded in raising considerable funds, which materially helped to place the finances which the rapid development of the school demanded on a more stable basis."

JOHN WYLLIE, M.D., LL.D. EDIN., F.R.C.P. EDIN.,

EMERITUS PROFESSOR OF MEDICINE, UNIVERSITY OF EDINBURGH.

John Wyllie, emeritus professor of medicine in the University of Edinburgh, died on Jan. 25th, at the age of 72, from an apoplectic seizure of which he had had a forewarning twelve months before. He was born in 1844 in Haddingtonshire and was educated at Edinburgh University, graduating there with honours in 1865, after which he was house surgeon in the Royal Infirmary to Professor Spense, and house physician to Dr. Rutherford Haldane. He then spent a summer in Paris attending Trousseau's lectures, and was for two years house physician at the General Hospital, Birmingham before returning to settle finally in Edinburgh in 1868. In 1870 Dr. Wyllie was elected a Fellow of the Royal College of Physicians of Edinburgh and became lecturer on pathology in the extra-mural school, and in 1878 lecturer on the practice of physic. He was for a time pathologist to the Royal Infirmary and also gave courses of lectures upon ophthalmology, laryngology, and medical electricity. In 1876 he was appointed assistant physician, becoming full physician in 1882. On the expiry of the usual term of 15 years he became, in 1897, consulting physician, to return again to the active staff in 1900 on succeeding Sir Thomas Grainger Stewart in the chair of medicine. He discharged the duties of his professorship until

his health first failed in December, 1914. Besides these teaching appointments, Dr. Wyllie was for 10 years honorary secretary to the Royal College of Physicians of Edinburgh, and was offered the presidency of the College; he was also examiner for the University in clinical medicine, and principal medical officer to the Scottish Equitable Insurance Company. In 1900 the University of Edinburgh conferred on him the honorary degree of LL.D.

His chief printed work was on the Disorders of Speech, published in 1894. This was regarded at the time as one of the most complete treatises on the subject in any language, and was characterised by admirable arrangement and lucidity of expression. The book contained the first clear enunciation of the share which the laryngeal mechanism takes in the act of whispering. Besides this original work, Dr. Wyllie was a frequent contributor to the Edinburgh Hospital Reports over a wide range of medical topics. But it was as a teacher rather than as a writer that Dr. Wyllie was known. He was deeply read in general medical literature and possessed the art of clear, forcible, and earnest exposition. His clinical lectures were models of conciseness and characterised by thoroughness of detail, and his influence as a teacher was heightened by his attitude to the students by whom he was regarded as a friend.

Although by nature of a reserved temperament, he showed throughout his life a characteristic independence of thought on medical topics which did not fail to bring him into opposition with others who held different views. Dr. Wyllie was a great traveller and his keen taste for fishing took him as far afield as Norway and Russia. He was unmarried.

SIR GEORGE AUGUSTUS PILKINGTON, M.R.C.S. ENG., J.P., D.L.,

HONORARY CONSULTING MEDICAL OFFICER TO THE STOCKPORT INFIRMARY.

Sir George Pilkington, who died at Southport on Jan. 28th at the age of 67, was a medical man, though far better known in his public than in his professional capacity, and, indeed, it is many years since he had joined the retired list. He was the son of a Cambridge surgeon, Mr. R. G. Combe, and received his medical education at Guy's Hospital, obtaining the diplomas of M.R.C.S. Eng. and L.S.A. in 1870. From Guy's Hospital he went to Southport as honorary medical officer to the Southport Infirmary, and in 1875 he married Mary, the daughter of Mr. James Pilkington, M.P., a well-known and wealthy cotton-spinner, whose name he assumed. He remained in practice until 1884, when he was elected Member of Parliament for the Southport Division of Lancashire, being in the same year mayor of Southport. He held the seat on this occasion for only one year, but was elected again in 1899 for the same constituency. In 1911 he was high sheriff of Lancashire. Sir George Pilkington was a very competent man of affairs and took an active part in the public life of Southport, while he always maintained his interest in his original profession.

THOMAS WILLIAM BUTCHER., M.B. C.M. EDIN.

Dr. T. W. Butcher, who died on Jan. 10th at the age of 48, was a well-known medical practitioner in Blackpool. He had been in failing health for about 12 months, but his end came quite unexpectedly.

Dr. Butcher was born at Preston and educated at Kirkham Grammar School. From there he went to Edinburgh University, where, when only 20 years of age, he took his M.B., C.M., holding the distinction at that time of being the youngest student to have gained the degrees. After hospital experience in Edinburgh he later acquired a practice in Blackpool.

Dr. Butcher took a keen interest in local public affairs. For 25 years he had held the appointment of medical officer to the Foxton Dispensary. He was public vaccinator and Poor-law medical officer for North Shore. He was also chairman of the Blackpool Insurance Committee, and one of the original trustees of the Victoria Hospital, in the foundation of which he took an active part.

Among scientific men in all parts of the country Dr. Butcher made a name for himself by his photo-microscopical researches. He was a Fellow of the Royal Photographic Society and President of the Blackpool Microscopical Society. His loss will be keenly felt in Blackpool, where he leaves a widow and one son.

JOHN HUMPHRY, M.R.C.S. ENG., L.S.A.

BY the death of Mr. John Humphry, which took place in London on Jan. 27th, at the advanced age of 91, the medical profession loses one of its oldest members. Mr. Humphry received his medical training at University College Hospital, and qualified in 1849. Thereafter he spent two years in the London Fever Hospital under Sir William Jenner, and was for five years medical officer at the Birmingham union infirmary. In 1855, during the Crimean War he acted as civil surgeon attached to the British Army Hospital at Renkioi, Asiatic Turkey. In 1856 he was appointed medical superintendent of the Bucks County Asylum, Stone, Aylesbury, which had then been opened about four years, and here he spent the remainder of his long professional career, retiring about eight years ago. Mr. Humphry's administration of the Bucks Asylum was characterised by kindly consideration for the patients and staff. He was always keenly interested in the treatment and care of the insane and his policy was marked by liberal ideas. His chief, almost his sole, interest was in the asylum under his charge, an interest which he retained to the very end of his long life.

CHARLES HENRY BROMHALL, M.B., CH.B. VICT.

THE profession in Nottingham has sustained a serious loss by the sudden death of Dr. C. H. Bromhall at the early age of 36. While opening an abscess on Jan. 7th he accidentally pricked his finger. This was followed by cellulitis of the arm and septicæmia. He died from heart failure on Jan. 16th. Dr. Bromhall was educated at the Royal Lancaster Grammar School, and afterwards studied medicine at the University of Manchester, where he took the degrees M.B., Ch.B. in 1903. After holding several resident appointments at Birmingham he became in 1907 resident medical officer to the Nottingham General Dispensary (Hyson Green Branch), and two and a half years later commenced practice in the city of Nottingham. Being a man of great energy and considerable natural ability, he rapidly acquired a large practice. Living in the heart of a great industrial district, he had a very long list of National Insurance patients. He was also one of the district medical officers under the Nottingham Union. Dr. Bromhall was a shrewd and capable practitioner. Although fully occupied with professional work he found time to keep abreast with the progress of medical science, and to perform many acts of kindness.

The War.

THE CASUALTY LIST.

THE following names of medical men appear among the casualties announced since our last issue:—

Killed.

Lieutenant A. N. Garrod. R.A.M.C., 100th Field Ambulance, qualified in 1914, and was house surgeon at St. Bartholomew's Hospital prior to joining the R.A.M.C. in October, 1915.

Died.

Colonel C. Stonham, C.M.G., A.M.S.

Wounded.

Captain J. E. T. Jones, R.A.M.C.

Lieutenant W. Campbell, R.A.M.C.

Captain H. H. B. Cunningham, R.A.M.C. (T.F.), attached to the West Lancashire Division Engineers (T.F.).

Lieutenant T. E. Hammond, R.A.M.C.

Lieutenant J. K. Stewart, R.A.M.C., attached to the 15th Batt. Durham Light Infantry.

Captain C. L. Spackman, R.A.M.C.

We very much regret that the name of Captain Spackman was included under the heading of "Died of Wounds" in our last issue. We are happy to be able to record that the galliant member of our profession is still with us.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Major O. St. J. Skeen, D.S.O., 62nd Punjabis, sixth son of the late Surgeon-General Skeen.

Captain N. Smith, Durham Light Infantry, second son of Dr. G. H. Smith, of Hull.

Captain A. G. A. Adam, 1/5th Buffs (Weald of Kent Battalion), fifth son of the late Dr. J. Adam, of Malling Place, Kent.

Lieutenant A. N. Garrod, R.A.M.C., eldest son of Colonel A. E. Garrod, A.M.S.

THE HONOURS LIST.

The following appointments of medical officers for services rendered in connexion with military operations in the field are announced:—

To be C.B.—Lt.-Col. W. W. Giblin, Australian A.M.C.

To be C.M.G.—Col. C. H. Hale, D.S.O., A.M.S.; Lieut.-Col. A. H. Sturdee, Australian A.M.C.

D.S.O.—Maj. W. R. Battye, I.M.S.; Maj. D. S. Skelton, R.A.M.C.; Capt. E. S. Phipson, I.M.S.

Military Cross.—Temp. Capt. J. H. Aikman, R.A.M.C.; Temp. Capt. G. D'R. Carr, R.A.M.C.; Capt. C. C. Fitzgerald, R.A.M.C. (T.F.); Capt. F. J. H. T. Frere, R.A.M.C.; Capt. W. Rutherford, R.A M.C. (T.F.); Temp. Lieut. H. B. Atlee, R.A.M.C.; Capt. E. T. Brennan, Australian A.M.C.; and Capt. C. W. Thompson, Australian A.M.C.

MENTIONED IN DESPATCHES.

The following officers connected with the medical profession, and occupying the indicated positions with our armies, are mentioned in Sir Ian Hamilton's despatch dated Dec. 11th, 1915, and issued from the War Office on Jan. 28th, 1916, in connexion with the operations in Gallipoli. It is a matter for deep regret that some of them are no longer with us.

Staff.—Col. M. J. Sexton; Lt.-Col. G. St. C. Thom, R.A.M.C.; Maj. (temp. Lt.-Col.) A. M. McIntosh, R.A.M.C. (T.F.); Lt.-Col. D. S. Skelton, R.A.M.C.; Lt.-Col. W. M. B. Sparkes, R.A.M.C.

Royal Army Medical Corps.—Lt.-Col. D. D. Shanahan; Lt.-Col. H. M. Nicholls; Lt.-Col. W. P. Gwynn; Lt.-Col. T. C. MacKenzie, D.S.O.; Lt.-Col. J. F. M. Kelly; Maj. Benson; Maj. R. R. Lewis; Capt. J. Y. Moore (S.R.); Capt. K. M. Levi, Australian A.M.C. (killed); Capt. C. Cassidy; Capt. J. C. Young (S.R.); Capt. F. J. H. T. Frere (S.R.); Capt. A. Glen (S.R.); Capt. G. S. Pirie (S.R.); Temp. Capt. R. B. Lilly; Temp. Capt. G. D'R. Carr; Temp. Capt. J. H. Aikman; Lt. H. H. R. Bayley; Temp. Lt. W. Macdonald; Temp. Lt. T. A. Peel (died of wounds); Temp. Lt. H. B. Atlee; Temp. Lt. G. S. Goodwin.

Royal Army Medical Corps (T.F.).—Lt.-Col. T. Fraser, Highland Field Amb.; Maj. (temp. Lt.-Col.) E. J. R. Evatt, Welsh Field Amb.; Capt. F. J. Green, Welsh Field Amb.; Capt. G. Raymond; Capt. A. Findlater, London Mounted Brigade Field Amb.; Capt. C. C. Fitzgerald; Capt. F. S. Bedale, E. Lancs. Field Amb.; Capt. M. R. Rutherford, Welsh Field Amb.; Capt. H. E. Quick, Welsh Field Amb.; Capt. J. Macquarrie; Capt. W. R. Bristow.

Australian Army Medical Corps.—Lt.-Col. C. Garner, Reserve of Officers; Lt.-Col. H. W. Bryant; Lt.-Col. A. H. Sturdee; Maj. H. A. Powell; Capt. (temp. Maj.) L. W. Dunlop; Capt. J. Bentley; Capt. E. T. Brennan; Capt. H. V. P. Conrick; Capt. A. L. Dawson; Capt. A. Y. Fullerton; Capt. C. W. Thompson; Capt. W. J. Stack; Capt. J. E. Dods; Capt. L. St. V. Welch.

New Zealand Medical Corps.—Maj. E. J. O'Neill, D.S.O.; Capt. K. McCormick; Capt. A. V. Short; Capt. R. N. Guthrie.

Indian Medical Service.—Capt. P. M. Rennie, attached to the 1/5th Batt. Gurkha Rifles; Capt. E. S. Phipson, attached to the 1/6th Batt. Gurkha Rifles; Maj. W. R. Battye; Maj. L. P. Brassey.

Indian Subordinate Medical Department.—No. 880 1st Sub-Asst. Surg. Ghaus Mohammed; No. 1233 2nd Sub-Asst. Surg. Sampuran Singh; No. 1270 2nd Sub-Asst. Surg. Amar Nath Puri.

It is announced in the *London Gazette* that the name of Major G. W. G. Hughes, D.S.O., R.A.M.C., is added to the list of those mentioned in the despatch from Viscount French dated Nov. 30th, 1915. The names of other medical officers in this list were given in THE LANCET of Jan. 8th, 1916.

THE CENTRAL MEDICAL WAR COMMITTEE.

The work of the Central Medical War Committee has proceeded energetically during the past fortnight and the difficulties of recruiting medical officers for the Navy and Army are being strenuously faced. The ignorance of the public and even of the medical profession of the status and work of the Committee is gradually being dissipated. Questions which have been asked in Parliament have led to the official announcement of the position of the Committee as the body to which the recruiting of doctors in England and Wales has been definitely left, and the satisfactory way in which that work has been done has been acknowledged by the War Office. And now the report of the Committee to the Council of the British Medical Association has made the whole story clear to the professional body whose energies initiated the movement.

The Central Medical War Committee may be said to be an advisory committee to the Director-General on matters which affect the relations between the medical demands of the army and the medical requirements of the civil population, and to act also as an active recruiting agency to secure medical officers for the R.A.M.C.

In Scotland the Scottish Medical Emergency Committee, and in Ireland the Irish Medical War Committee have received similar recognition. The Army Council has announced that no qualified medical practitioner willing to accept, if offered, a commission in the Royal Army Medical Corps would be accepted as an ordinary combatant, and the certificate of enrolment issued by the committees will be accepted as conclusive evidence on this head by all recruiting officers. Medical practitioners so enrolled, the Army Council stated, will not be

posted to a combatant unit, and will await the instructions of the Central Medical War Committee, or the Scottish Medical Emergency War Committee, as the case may be. (The communiqué was issued before the official recognition of the Irish Committee.)

The duty of the Central Medical War Committee, whose personnel has been published in our columns and includes representatives of the Scottish and Irish Committees, is not only to secure medical officers for the new armies, but also men to take the place of those who have been invalided, or who, having served one year, have returned to civil life. This class is a small one.

The effort must be continued, for the demand cannot be expected to diminish. Local Medical War Committees have been appointed in 168 out of 172 areas in England and Wales, and the work of these Committees is growing in importance. They act as recruiting agencies, and owe their efficiency to the fact that they must know all the men of military age, their position, the possibility of sparing them from civil work, and how best to safeguard their practices. Recently the Director-General has promised to put all the Local Committees in touch with the Deputy Director in each home command, so that changes in mobilisation may be known and arranged for.

The Central Medical War Committee now presses for the enrolment of every medical man of military age—that is, of 45 years and under. Every man who is in doubt is asked to put his case before the Committee for consideration and decision. Only by a complete enrolment can the Committee know the general position and do justice as between man and man and district and district. Not every enrolled man will be called upon to go, and no man will be called upon without consultation with his Local Committee. The Committee is aware that enrolment presses more severely upon some than upon others, and it may be that members of the medical profession will defer enrolling, hoping for an opportunity to consider further the means by which the civilian profession can best help the naval and military medical services. It must be pointed out that the fairness of the enrolment scheme depends upon its wide acceptance by the constituency.

The need for the economical use of medical officers has been a constant source of comment in all our reports of the Central Medical War Committee; it is dealt with in a lengthy section of the report of the Committee to the Council of the British Medical Association, and the subject was debated earnestly by the Council. The Committee has had many interviews on the matter with the Director-General, and has reported that while it believes that individual instances of wastage may be proved, it has been convinced by its communications with the Director-General that on the whole these complaints are due to ignorance of the larger questions of army medical administration. This is the view which our own information has always impelled us to take. The present circumstances of war make many men in different branches of the army apparently idle for the moment, but they must be on the spot to meet the developments of design or accident. To quote the report: "The Committee feels that, after all, the responsibility must rest upon the military authorities, who would be blamed if at any given time it were found that there were not sufficient medical officers, and the Committee does not consider that it is wise or patriotic to question the decision of the military authorities, arrived at, as the Committee has good reason to know, after full consideration of the criticisms that have been offered."

THE CLIMATE OF SALONICA.—"Weather data for the whole Balkan region are very scanty, and considerably better detailed records are available for most parts of Central Africa than for the late Turkish Empire. In the case of Salonica, however, some 15 years' systematic observations have been collected at a local secondary school, and the publication of an abstract of these observations may be of use to those serving and about to serve there." Thus writes a correspondent, who has accordingly collated and transformed into English terms the records of ten years, which should give a close approach to the true climatic means of the locality.

The mean annual temperature of Salonica works out at 61° F., or about 10° warmer than the South Coast of England. The mean annual rainfall is 23·4 inches, about two-thirds of that of England and Wales, and the number of rainy days in the year averages 103, fairly evenly distributed throughout the year, though May is the rainiest month, with 12·8 days on which rain falls. Snow falls only once or twice in the year, and is rather commoner in February than in the earlier part of the winter. Hoar frost rarely occurs before November and may be seen as late as March. Throughout the year heavy winds are exceptionally rare, and notably so during winter, two or three stiff blows being quite a heavy record; but there is usually a gentle breeze, and absolute calms are unusual. From the mere climatic point of view, in fact, Salonica compares well with the Riviera, and, were the amenities of life at all comparable, it has many claims as a winter resort. The proportion of cloud to clear sky is also singularly uniform through the year, and approaches so closely to half and half for all months, that after calculating the averages it seemed hardly worth tabulating this datum.

Individual months in particular years, however, occasionally differ widely from the average. In November, 1896, 8 inches of rain fell, but in the same month of the next year only three-quarters of an inch, and the average minima for January vary to the extent of 13°–14° F. The temperature has been known to fall as low as 17° F., but, on the other hand, days with a maximum temperature of 60° are not uncommon in the depth of winter, and 80° has been recorded in March. The subjoined table gives the essential climatic data for the six colder months of the year.

Climatic Constants for Salonica at 45 Feet above Sea.

Month.	Mean temperature of month (F.).	Mean lowest daily temperature.	Highest temperature recorded in 10 years.	Lowest temperature recorded in 10 years.	Average humidity, per cent.	Rainfall of month in inches.	Mean number of rainy days in month.
November ...	51·2	47·0	79·8	24·4	72	2·6	8·5
December ...	45·8	39·2	64·0	20·0	78	2·4	10·3
January	41·7	35·8	66·5	18·7	71	1·6	7·7
February	44·0	40·0	70·0	0·0	68	1·1	9·4
March	49·8	43·4	80·0	31·9	66	1·3	11·0
April	57·0	50·0	82·0	35·2	67	2·2	9·6

The heat in summer is rarely excessive, though maxima running well into the nineties are not uncommon. July is the hottest month, during which the average daily minimum is 70°. But the crests of the amphitheatre of hills which surrounds the town are, at their highest points, quite 3000 feet above the sea level. At such an elevation the temperature would normally be some 10° lower than those tabulated, with intermediate temperatures at the intervening levels. On these elevations the climate in summer should be very pleasant, but rather cold in winter, though without the damp miseries of the Flemish trenches. The strata, too, are mainly of mica-schist, so that the trenches should drain easily. The sanitation of the town itself would not, presumably, concern the Allied forces. In low-lying areas malarial patches are not uncommon throughout Greece, but such foci rarely cover

much ground. The population of Salonica is accepted as about 150,000, of whom some 60,000 are a special type of Levantine Jews, who migrated from Spain some centuries ago to avoid religious persecution, and who still speak a bastard jargon which they call Ladino and fondly believe to be Latin. Inland the climate changes very rapidly to the continental type, with large annual and diurnal ranges of temperature, differing entirely from the typically marine climate of Salonica. In fact, though detailed reports are lacking, the inland climate resembles rather that of the great Canadian plains, though without the extremely low temperatures there encountered.

TUBERCULOUS CASES ON ACTIVE SERVICE.—An interesting comment on our remarks regarding the incidence of tuberculosis among the troops at the various seats of warfare is afforded by the report presented by Dr. G. S. Banks, the tuberculosis medical officer for Aberdeen, to the Burgh Insurance Committee. In this report Dr. Banks gives the number of insured tuberculous persons formerly in receipt of sanatorium treatment who have joined the military or naval forces. The number of such persons on Jan. 12th, 1916, was 64, of whom 57 were on military and 7 on naval service (mine-sweeping). Of the total, 58 were suffering from pulmonary disease, and of these 34 had received sanatorium or hospital treatment for various periods. One man actually enlisted while he was a patient in the tuberculosis wards of the city hospital. Out of the 64 who enlisted, 19 have recently been on active service—14 at the Western front and 5 on mine-sweepers. Among six men discharged from the services one had enlisted no fewer than three times before being finally discharged, and three had been discharged from one branch of the service and then enlisted in another. As regards the severity of the disease, out of 48 pulmonary cases, 1 was of the first, 12 of the second, and 35 of the third stage (Turban). Twenty out of 43 whose sputum had been examined gave a positive result. Of the 14 cases at the Western front, of whom 3 were known to have had tubercle bacilli in the sputum, 4 were glandular, 10 pulmonary, and of these 10 six were in the second stage and four in the third. From the fact that out of 14 men accepted for foreign service only one had broken down in health, and that only temporarily, Dr. Banks concluded that the conditions of life in the field are not unfavourable to the maintenance of the general health of the tuberculous patient if the disease is not active or far advanced. In his opinion the common belief that a great risk to health inevitably follows a continued exposure to the rigours of winter is not corroborated by this experience, and any risk that may exist is more than counterbalanced by the general influence for good which attends a life constantly led in the open air. The analysis of Dr. Banks is based on a small number of cases, and any conclusion drawn from them must be of a tentative nature; but the subject is one which merits serious consideration and a possible reconsideration of the attitude which excludes from military service any man who has had a history of any form of tuberculosis.

ROYAL SOCIETY OF MEDICINE: EMERGENCY SURGICAL AID CORPS.—We have received the report of the general meeting of this corps, which was held at 1, Wimpole-street, W., on Oct. 27th, 1915. Sir Rickman J. Godlee was in the chair, and 33 members were present. The War Office was represented by Surgeon-General J. C. Culling and Major G. S. Mansfield. Mr. Edwards, secretary to the Commissioner of Police for the Metropolis, had been deputed to represent Scotland Yard. The chairman reported that two distinct duties had been imposed upon the executive: (1) That of arranging for assistance in the case of raids of any description on the East Coast from Dover to the Wash; (2) that of organising for similar help in the case of aerial raids on the metropolis. Since the starting of the corps, 155 gentlemen had volunteered to serve. Of these a considerable number had been obliged to retire owing to having undertaken other military duties, but 107 names still remained on the list. There had been nine calls to date—two for the East Coast and seven for London. On eight occasions the corps was asked to "stand-by" till danger appeared to be over, and was at length told that it might disperse. On the last occasion the summons did not reach them till one hour after the disaster, and by the time the corps arrived on the scene (within 10 minutes of the call) all the wounded had been taken away. As a result of a private call, some of the corps went to Charing Cross Hospital, and as soon as the situation was explained were kept very busy till a late hour. The chairman submitted that in spite of this experience there were good reasons for not disbanding the corps. Surgeon-General Culling then tendered the warm thanks of the War Office to the members of the corps for the generous way in which they had spontaneously taken upon themselves such important duties; he desired to assure them that the mere knowledge that there was such a body to fall back upon in case of need was a source of great comfort to the War Office, and he added that he was authorised to say that the need for their services was graver than ever, and he believed that before long they would find more than enough to do. After some discussion the report of the chairman was unanimously adopted. The following were then elected as the executive committee for the ensuing year: Sir Rickman J. Godlee (chairman), Mr. Stanley Boyd, Mr. A. H. Cheatle, Mr. Ernest Clarke, Mr. Edred M. Corner, Mr. McAdam Eccles, Mr. G. J. Jenkins, Dr. H. Moreland McCrea, Mr. J. W. Thomson Walker, and Mr. J. Y. W. MacAlister (honorary secretary).

RED CROSS SALES.—Arrangements are being made to hold a Red Cross sale at Christie's shortly before Easter. Many well-known people have given pictures, books, silver, china, and furniture, and distinguished artists are contributing blank canvases which will be afterwards filled in according to the purchaser's desire.

On Saturday, Jan. 22nd, a Red Cross week was inaugurated at Croydon by a procession through the main streets, a feature of the pageant being a German gun captured at Loos by the 20th County of London Regiment. Auctions were opened by Princess Christian and Lady Gosford at which over 3000 lots were offered for sale. These included a handkerchief sent by Queen Alexandra and a pen-and-ink sketch of the Empress Frederick by Queen Victoria, sent by King Manoel. The gifts sent in for disposal at the auctions have been so large that it has been decided to repeat the auctions next month. Up to the present they have produced £1500.

QUEEN'S UNIVERSITY OF BELFAST: ROLL OF HONOUR.—This testimonial to the splendid work which Belfast University has done in connexion with the war is now in its third edition, and has been corrected to January, 1916. The roll, which includes the names of the dead who have bravely served their country, and of the living who in various capacities are performing war service, is, as the prefatory note states, continually changing, and complete accuracy is scarcely attainable. To the medical names in the obituaries which have already appeared in our columns we must now add the name of Staff-Surgeon T. D. Liddle, R.N.

THE LATE CAPTAIN WILLIAM FRANCIS SMARTT, R.A.M.C.—Captain W. F. Smartt died at the Norwich Red Cross Hospital on Jan. 15th as the result of a motor-car accident. Qualifying in 1882, he was formerly Government medical officer at British Guiana, and recently in practice at Bathford, near Bath. He joined the Royal Army Medical Corps early in the war. Captain Smartt was in his fifty-fifth year and unmarried.

WOMEN'S MATERNITY UNIT FOR RUSSIA.—A second medical officer, Miss Beatrice Coxon, L.R.C.P. & S. Edin., has been appointed to this unit. Dr. Coxon shared the hardships of the retreat from Serbia through Montenegro and Albania. Both she and Dr. Mabel May were awarded the Serbian Order of St. Sava.

GIFT OF MOTOR AMBULANCES.—The Federation of Master Cotton Spinners have decided to build 14 motor ambulances and to provide the running expenses for a year at an estimated cost of £8400.

NEWS has been received by the Wounded Allies Relief Committee that Dr. W. H. G. Aspland, who was in charge of their Serbian unit, and is now with his wife a prisoner of war at Vrnjatchka Banja, Serbia, is well and cheerful, and is being kindly treated by the Austrians.

THE Cornwall Royal Naval Auxiliary Hospital was opened on Jan. 19th in a building which was formerly the Truro workhouse, now excellently equipped at a cost of about £2450 for the reception of 150 patients.

OBITUARY OF THE WAR.

ARNOLD BOSANQUET THOMPSON, M.B., B.CH. OXON.,
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain A. B. Thompson, who was killed in action in Gallipoli on Christmas Day, at the age of 29 years, was the son of Mr. Arthur Thompson, of Garthlands, Reigate Heath. Captain Thompson passed from Haileybury, where he was at school, to New College, Oxford, and there began his medical work, completing his curriculum at the London Hospital. Both at Oxford and at the London Hospital he was known as a quiet man, choosing his friends carefully, who showed remarkable promise, and whose work, whether in the lecture-room or in the wards, was of the highest merit. After qualifying he was appointed house surgeon to Poplar Hospital, where he gained a thorough medical and surgical experience. Since April, 1915, he was attached to the Field Ambulance, East Lancashire Division, in which he had already proved his worth. In expressing his sympathy with the parents in their loss of a gifted son one of his teachers adds, "Indeed, all who knew this man loved him for the high ideals which governed his actions."

ALFRED OSWALD HOOPER, M.B., M.CH. EDIN.,
STAFF SURGEON, ROYAL NAVY.

Staff-Surgeon A. O. Hooper, R.N., who was killed in the recent explosion on board H.M.S. *Natal*, was the eldest son of Dr. Alfred Hooper, formerly of Burton-on-Trent. He was born in 1878 and received his earlier education at Burton-on-Trent Grammar School and Epsom College. From Epsom he proceeded to Edinburgh University, graduating M.B., M.Ch. in 1903. He then obtained the appointment of assistant house surgeon to the Leicester Royal Infirmary, relinquishing this post in order to join the Royal Navy. After his course at Haslar he received his first commission as surgeon to H.M.S. *Devonshire*, and later he was transferred to the *Waterwitch* (China Station). During two years in the Far East he made good use of his ample opportunities of studying tropical diseases. On returning to this country he was appointed to the Royal Naval Hospital, Devonport, he was afterwards gazetted to H.M.S. *Swift* and *Blenheim*, and in 1912 obtained his staff appointment and gazetted to H.M.S. *Natal*. In 1911 he married Eileen Mary, youngest daughter of the late Lieutenant-Colonel W. C. Goslin, 2nd Hampshire Regiment, by whom he leaves one son. In the field of sport he was well known as an enthusiastic Rugby footballer, and was also a good cricketer, representing on various occasions both his university and the navy. Latterly his chief recreation when ashore was golf. A former brother officer and fleet-surgeon writes: "It will be some consolation for us all to know that the world was the better for his life; his sterling integrity of purpose, his uprightness of character, and that personal charm which made him loved by those who came into contact with him, provided a living daily example of all the best qualities of a man."

Medical News.

UNIVERSITY OF OXFORD.—The following degrees have been conferred:—

B.M., B.Ch.—M. R. Lawrence, C. Dean, A. Traill, L. Gameson, A. G. East, G. T. Gimlette, and D. M. P. Whitcombe.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At the First Professional Examination for the Licence in Dental Surgery held on Jan. 27th and 28th the following candidates were approved in the undermentioned subjects:—

Mechanical Dentistry and Dental Metallurgy.—Edward Honoré, Clarence Caute, Francis Desmond Donovan, and Leonard Allen Doughty, Royal Dental Hospital; Horace Leonard Ide, Guy's Hospital; William Eric Milton, Royal Dental Hospital; John Austen Ogden, D.D.S. Michigan, Michigan University; William Gerrit Ryss, Royal Dental Hospital; and William Holder Shipway, Bristol University.

Mechanical Dentistry.—Victor Henry Ball, London Hospital; Morgan James Evans, Birmingham University; Edwin Spencer Goodwin, Guy's Hospital; Jack Kenneth Grayson, London Hospital; Walter Samuel Hill, Leeds University; James Ernest Horton, London Hospital; Thomas Sidda Hoyland, Sheffield University; Reginald William May, Royal Dental Hospital; Claire William Roberts, Chicago University; Richard Stanislaus Roche, Guy's Hospital; and Thomas Alexander Moffat Wilson, Harvard University and Guy's Hospital.

Dental Metallurgy.—Alice Maud Mary Clegg, Liverpool University; Alan Evelyn, Bristol University; Iris Elizabeth Gardiner, Myer Garfinkel, and Florence Goodman, National Dental Hospital; Francis Joselin Janch, Royal Dental Hospital; Helen Pattie Clara Mayo, National Dental Hospital; Johann Lodewijk te Water Naude, Royal Dental Hospital; Louis Rabinowitz, Guy's Hospital; Albert Edward Rees, National Dental Hospital; William Goodwin Senior, Leeds University; Bertram Adolphe Siedle and Dorothy Mary Smith, National Dental Hospital; William Howroyd Smorfitt, Leeds University; and Ina Valentine Vincent, National Dental Hospital.

UNIVERSITY OF BRISTOL.—At the second examination for the degrees of M.B., Ch.B. the following candidates passed:—

Hilda Mary Brown, Sukhasagar Datta, Marjorie Smith Neville, and Thomas Henry Algernon Pinniger.

UNIVERSITY COLLEGE, LONDON.—A special introductory medical course in physics, chemistry, and biology for students desirous of beginning their medical studies will be held at University College and will commence on March 1st. Intending students should communicate forthwith with the Provost, University College, Gower-street, London, W.C.

Alderman W. E. St. L. Finny, M.D., M.Ch., J.P., of Kingston-upon-Thames, has been called to the Bar.

LITERARY INTELLIGENCE.—Dr. Mark H. Rogers, of Boston, has been appointed Editor of the *American Journal of Orthopedic Surgery*, which will henceforth be issued monthly, by Ernest Gregory, 126, Massachusetts-avenue, Boston. The subscription price is $4.00 per year.

MEDICAL SICKNESS AND ACCIDENT SOCIETY.—The usual monthly meeting of the executive committee of this society was held at 300, High Holborn, on Jan. 21st, with Dr. F. J. Allan in the chair. The accounts for the month of December showed that the sickness was up to the expectation, but that for the whole year the total experience was below total expectation. The new proposals received were fewer in number than for the same month in the preceding year, and it is not anticipated that this branch will show high figures in the coming year. The figures for proposals for more sickness benefit from existing members continue to show good returns; the increase in the cost of locum-tenents appears to account for this to some extent. The society still accepts members of the Royal Army Medical Corps for limited amounts in sickness benefit and life

assurance without extra premium. A letter was read from the son of the late Dr. George Allan Heron, thanking the committee for their resolution of condolence on his death. The late Dr. Heron was a trustee of the society for many years and took a great interest in its financial well-being. It was resolved to form an investment reserve, and to place to this account a sufficient sum to meet the depreciation in stock values. This only amounts to £4000. The date of the annual meeting of the members was fixed for March 28th, and a notice to this effect was ordered to be placed in various medical journals. In spite of the difficulties attending the various removals of members owing to the war, it is satisfactory to report that the lapses number fewer last year than the year before. For all information application should be made to the Secretary, Medical Sickness and Accident Society, 300, High Holborn, London, W.C.

A NEW PHTHISIS PAVILION FOR WALLASEY.—A new phthisis pavilion at the Mill-lane Hospital, Liscard, was formally opened on Jan. 22nd by Mr. Harold Coventry, chairman of the health committee of the Wallasey corporation. Mr. Coventry said that the health committee commenced to treat phthisis in their hospital in 1911, and before the passing of the Insurance Act had treated 36 cases. Since the passing of that Act they had in 1913 admitted 35 cases, in 1914 89, and in 1915 72 cases. Out of the total cases admitted only 17 were discharged without improvement, while 55 were improved and 100 much improved. An allied institution was the tuberculosis dispensary, where people living at home received treatment, and where contacts and suspicious cases were examined and dealt with. The new pavilion, with its spacious verandahs and southern aspect, had sleeping accommodation for 11 males and 11 females. The total cost had been £2300, of which amount the Local Government Board have undertaken to pay the recognised proportion.

Mr. A. Banks, the chairman of the insurance committee and ex-chairman of the health committee, dwelt upon the value of the work which had been undertaken and upon the wisdom shown in planning the new pavilion. Dr. T. W. N. Barlow, the medical officer of health, thought this was a favourable opportunity to mention three matters in connexion with phthisis which he considered to be of importance. The first was that, in order to prevent disappointment, too much must not be expected from sanatorium treatment. There was no panacea for the treatment of tuberculosis. If there were, there would not be such acute differences of opinion among the medical profession as now exist with regard to the value of this or that treatment. All were, however, agreed that for any treatment to have any chance of success it must be carried out under the best possible conditions. These conditions obtained in the present building. The second point was the necessity of providing accommodation for advanced cases. Advanced cases were the most infectious, and therefore the most dangerous to the community, and it was futile to think of eradicating tuberculosis whilst the advanced cases remained at home, many of them under very unsuitable conditions. As Sir Clifford Allbutt had said, it was like trying to fill with water a bucket that had a hole in the bottom, for as fast as the early cases were cured fresh cases arose from contact with those advanced cases. The third point was that the public had been educated on wrong lines with regard to the infectivity of phthisis. Many people imagined that it was infectious in the same degree as scarlet fever or any of the other common infectious diseases, with the result that the vast majority of people were mortally afraid of infection, while those affected were sometimes treated as lepers. They should be taught that while it was a communicable disease it need not even be that if the patient exercised proper precautions, and it was the primary function of sanatorium treatment to teach people how not to become a danger to their fellows.

The building, while it broadly conforms with the Local Government Board's plan, differs from it in several particulars. There was not enough space in the grounds, if the proposed accommodation were provided, to build it in one straight line, and as this building was provided primarily for advanced cases (the early cases are to be treated in a sanatorium to be provided by the Cheshire county council and the county boroughs in the county) the difficulty of space was got over by (1) providing at either end a ward for four beds, and (2) slightly inclining each wing from the central dining-room. In addition to the two four-bedded wards there are six double-bedded and two single-bedded cubicles, with a large dining-room and playroom for both sexes in the middle and the kitchen offices behind. There are baths, lavatory accommodation, and lockers in each wing, with a wide-covered verandah running the whole length of the building.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Prorogation of Parliament.

PARLIAMENT was prorogued on Thursday, Jan. 27th. A new Session will begin on Tuesday, Feb. 15th. Amongst the Acts which received the Royal Assent was the Military Service Act.

British Casualties.

Mr. ASQUITH has given the following statistics as to the total British casualties in all fields of operations up to Jan. 9th:—

	Killed.	Wounded.	Missing.
France.			
Officers	5,138	10,217	1,691
Other ranks... ...	82,130	248,990	52,344
Dardanelles.			
Officers	1,745	3,143	353
Other ranks... ...	26,455	74,952	10,901
Other Theatres.			
Officers	918	816	101
Other ranks... ...	11,752	15,165	2,656

Total casualties:—France, 400,510; Dardanelles, 117,549; Other Theatres, 31,408—Grand total, 549,467. Total officers, 24,122; Other ranks, 525,345.

HOUSE OF COMMONS.

WEDNESDAY, JAN. 26TH.

War Nurses in Uniform.

Mr. WATT asked the Under Secretary for War whether his attention had been called to the fact that nurses in uniform passing back and forward to France were not granted the same privileges as soldiers or any advantage over the general public in having their passes examined; that this frequently subjected them to long waits, sometimes exposed to the weather; and, if so, would he see that such nurses, being on war service, were put on the same level as soldiers in the way of journey privileges.—Mr. TENNANT answered: Nurses in the uniform of Queen Alexandra's Imperial Military Nursing Service and others who travel with military warrants embark and disembark from military gangways and are on the same footing as soldiers. Ladies temporarily employed as nurses with certain voluntary organisations who do not travel on military warrants or under military orders pass the examination of passports as all passengers do. The regulations which make this examination obligatory were drawn up by the French and British military authorities, and are necessary in order to prevent impersonation.

Mr. WATT: Can the right honourable gentleman say how these nurses are to become entitled to these travelling privileges?—Mr. TENNANT: It depends upon whether they are engaged upon military duties in the strict sense of the word or whether they are members of some voluntary agency.

Medical Appliances for Military Hospitals.

Answering Mr. R. GWYNNE, Mr. TENNANT said: There are no regulations in military hospitals directing that medical appliances are to be ordered only from Woolwich. The regulations already provide for local purchases under specially urgent circumstances not admitting of delay, but as these local purchases are a more expensive method of meeting requirements than obtaining what is wanted from War Office contractors they are restricted to cases of urgent necessity.

Advisory Board for Army Medical Services.

Mr. LYNCH asked the Under Secretary for War whether the Advisory Board for Army Medical Services was now on the Army List; whether it was instituted by Order in Council on the advice of the Secretary of State for War, and at what date; whether its members were paid by the Treasury; whether the decisions of the Directors-General in

England and France were subject to the concurrence of this Board; and why it had not been summoned to meet once in its collective and consultative capacity since the war began.—Mr. TENNANT answered: The Advisory Board, like all other similar bodies, appears in the Army List. It was not instituted by Order in Council, nor is it statutory. Those of its members who receive pay receive that pay from army funds. The answer to the fourth part of the question is in the negative, and the answer to the fifth part has frequently been given in answers to previous questions put within the last few weeks.

Mr. LYNCH: In view of the need of efficiency, would it not be well to avoid the multiplication of these derelict institutions?—Mr. TENNANT: This body has done very valuable service, and its members are now being employed by the Government. Therefore I do not think it may be so described.

Mr. LYNCH: Has it done the service for which it was instituted?—Mr. TENNANT: Yes; in peace time.

Replying to a further question, Mr. TENNANT said: The non-official members of the Board in England are employed in an advisory capacity. Those in France are similarly employed as an advisory board to the Director-General of the Medical Service.

THURSDAY, JAN. 27TH.

Scottish Medical Service Emergency Committee.

Sir H. CRAIK asked the Financial Secretary to the War Office whether the Central War Committee connected with the British Medical Association extended its operations beyond England and Wales; whether an independent organisation, called the Scottish Medical Service Emergency Committee, had previously been instituted in Scotland; if so, what was its composition and what were the functions it undertook to perform; and whether the War Office had accorded to the Scottish Committee the same recognition in relation to Scotland as it had accorded to the Central War Committee in London.—Mr. FORSTER replied: The Central Medical War Committee besides dealing with England and Wales extends its operations to Ireland. The Scottish Medical Service Emergency Committee has been accorded the same recognition in relation to Scotland. The functions of both committees are similar. I will send the honourable gentleman a list of members of the Scottish Committee if he will permit me to do so. It would take too long to read it out to the House now.

Temporary Medical Officers' Rations.

Sir CLEMENT KINLOCH-COOKE asked the Financial Secretary to the War Office whether the contract in respect to rations in the case of temporary medical officers was the same as in the case of dental officers; and, if not, could he see his way to place the two contracts on the same footing.—Mr. FORSTER answered: Both contracts provide for the issue of free rations while in the field.

Distribution of Wounded Soldiers in Hospitals.

Mr. BARNES asked the Financial Secretary to the War Office whether he was aware of the inconvenience and cost to the relatives of wounded soldiers in consequence of such soldiers being sent to hospitals far removed from their homes or where they enlisted; was he aware that of 100 wounded men sent for treatment last week to Bellahouston, in Scotland, only 12 belonged to Scottish regiments; and would he have inquiry made with a view to getting men sent nearer their homes, so as to lessen the cost to relatives visiting them.—Mr. FORSTER said in reply: I fully appreciate the desirability of doing what is suggested by my right honourable friend, and I can assure him that, as far as possible, the existing practice is in conformity with what he suggests. It is not, however, possible to send every man to the hospital to which he would prefer to be admitted. Some men are too ill to stand the fatigue of the journey. Others are earmarked overseas for admission to hospitals specially set apart for the class of sickness or injury from which they are suffering. It is also necessary to distribute men in ambulance train loads—that is, in groups of a hundred or so, as railway conditions do not permit of the disturbance of traffic which would arise from a train depositing cases here and there at hospitals not the port of disembarkation and the ultimate destination of the train. Under these circumstances some men must find themselves in hospitals remote from their homes, but arrangements can generally be made for the patient's transfer to a hospital near his home as soon as the medical authorities are satisfied that the case is a suitable one for treatment in the hospital to which the transfer is requested.

Medical Re-examination of Rejected Recruits.

Mr. THOMAS asked the Under Secretary for War whether he was aware that local recruiting officers were summoning men who had been previously rejected under Lord Derby's scheme to submit to a further medical examination; and whether, having regard to the fact that these men hold a white certificate which stated that they presented themselves to join the army but were not accepted on medical examination, they would be exempt under the Military Service (No. 2) Bill.—Mr. TENNANT answered: In view of many decisions which had to be hurriedly reached and the desirability for greater uniformity a fresh medical examination will be necessary.

First Eastern General Hospital.

Mr. CAUTLEY asked the Financial Secretary to the War Office to say under what arrangement medical students were employed at the 1st Eastern General Hospital, Cambridge; how many medical students were now employed at that hospital, and whether these students had passed a medical examination in anatomy and physiology; whether he could see his way to extend the employment of senior medical students in military hospitals in this country without requiring them to enlist as private soldiers in the Royal Army Medical Corps; and whether, by adopting this course, a certain number of qualified medical men now working in those military hospitals could be set free for other duties.—Mr. FORSTER wrote in reply: All I can say in reply to the first two parts of the question is that the employment of these students is a private arrangement between the Cambridge Teaching School and the officer commanding the 1st Eastern General Hospital. It is possible that senior students may do work in military hospitals elsewhere under similar arrangements, but if they have not completed the prescribed period of their medical studies they would not be exempt from combatant military service under Lord Derby's scheme. The students employed in this way could not, however, undertake the duties of qualified medical men.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.*

BARROW, G. A., M.R.C.S., L.R.C.P. Lond., has been appointed Anæsthetist to the Manchester Ear Hospital.

COUPLAND, W. H., L.R.C.P. & S. Edin., L.F.P.S. Glasg., has been appointed Medical Superintendent at the Royal Albert Institution, Lancaster.

FRASER, C. L., F.R.C.P. & S. Edin., D.P.H., has been appointed Temporary Medical Officer of Health for Berwick Borough.

MACFADYEN, N., M.B Lond., D.P.H., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Baldock District of the county of Hertford.

SALMON, ARTHUR GUY, M.D., B.S. Lond., L.R.C.P., M.R.C.S., L.S.A., has been appointed Temporary Medical Officer for the Workhouse, and No. 2 District, by the Bodmin (Cornwall) Board of Guardians.

VERHEYDEN, M. H. (Mrs.), L.D.S. Edin., has been appointed Dentist to the Scattered Homes by the Brentford Board of Guardians.

WYSE, G. H., L.R.C.P. & S. Edin., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Lytham District of the county of Lancaster.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).
When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRKENHEAD BOROUGH HOSPITAL.—Junior House Surgeon. Salary £170 per annum, with board and laundry.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street.—House Surgeon. Salary £200 per annum, with residence, board, &c.

BRISTOL ROYAL INFIRMARY.—House Physicians and House Surgeons. Salary at rate of £120 per annum, with board, apartments, and laundry.

BURY INFIRMARY.—Senior House Surgeon. Salary £250 per annum, with board, residence, and washing.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board and laundry.

ENDSLEIGH PALACE HOSPITAL FOR OFFICERS.—Resident Medical Officer. Terms £1 1s. per day.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—House Physician for six months. Salary 30 guineas.

LEEDS PUBLIC DISPENSARY.—Female Resident Medical Officer. Salary £130 per annum, with board, residence, and laundry.

LISCARD, VICTORIA CENTRAL HOSPITAL, Wallasey.—House Surgeon. Salary £160 per annum, and all found.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury.—Resident Medical Officer, unmarried, for six months. Salary at rate of £100 per annum, with bonus of £5 per month.

MANCHESTER NORTHERN HOSPITAL FOR WOMEN AND CHILDREN, Parkplace, Cheetham Hill-road.—Female House Surgeon. Salary £120 per annum, with apartments and board.

MANCHESTER ROYAL EYE HOSPITAL.—Junior House Surgeon. Salary £100 per annum, with £50 war bonus, residence, board, and washing.

NEW HOSPITAL FOR WOMEN, Euston-road, N.W.—Female Senior Clinical Assistants in Out-patient Department.

PRINCESS CLUB HOSPITAL FOR WOUNDED, 106, Jamaica-road, Bermondsey, S.E.—Resident Medical Officer. Salary at rate of £150 per annum, and all found.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Ophthalmic Surgeon for three months.

SUNDERLAND ROYAL INFIRMARY.—Female House Surgeon. Salary £150 per annum, with board, residence, and laundry.

THROAT HOSPITAL, Golden-square, W.—Resident House Surgeon.

WEST BROMWICH AND DISTRICT HOSPITAL.—Assistant House Surgeon, unmarried. Salary £120 per annum, with residence, board, and laundry.

Births, Marriages, and Deaths.

BIRTHS.

GORDON.—On Jan. 29th, at Stanway, South Farnborough, Effield, the wife of A. Bruce Gordon, F.R.C.S. Edin., Temporary Lieutenant, R.A.M.C., of a daughter.

HALL.—On Jan. 24th, at The White House, Eastbourne, the wife of E. Wilson Hall, M.R.C.S., L.R.C.P. Lond., of a daughter.

HILL.—On Jan. 31st, at Greenhayes, Banstead, Surrey, the wife of Captain F. T. Hill, R.A.M.C., British Expeditionary Force, of a daughter.

RAMBAUT.—On Jan. 25th, at Priory Cottage, St. Andrew's Hospital, Northampton, the wife of Daniel F. Rambaut, M.D. Dub., of a son.

STEWART.—On Jan. 24th, at "Wiggenhall," Sevenoaks, the wife of Captain W. J. Stewart, R.A.M.C., of a daughter.

MARRIAGES.

HAMPSON—FINNEMORE.—On Jan. 28th, at All Saints Church, Four Oaks, Captain Travis Hampson, M.B. Birm., R.A.M.C. (S.R.), to Alice Mary, younger daughter of the late Alfred Finnemore and Mrs. Finnemore, of Chesterton, Four Oaks.

SINCLAIR—SOUTER.—At Forres, N.B., on Jan. 8th, by the Rev. Gordon Watt, M.A., Neil Frederick Sinclair, M.R.C.S., L.R.C.P., to Chrissie Stewart, second daughter of Mr. and Mrs. Souter, Forres.

SUTHERLAND—THOMSON.—On Jan. 26th, by special licence, at St. Catherine's Parish Church, Merstham, Surrey, Major Donald Sage Sutherland, M.D. Glasg., R.A.M.C.(T.), 1st City of London Field Ambulance, to Louise Mary, youngest daughter of Albert Sudbury Thomson.

DEATHS.

BOYD.—On Feb. 1st, at Harley-street, W., Lieutenant-Colonel Stanley Boyd, R.A.M.C. (T.F.), F.R.C.S. Eng., aged 59 years.

CARTER.—On Jan. 24th, at Marden Ash, Ongar, Surgeon-Major Frederic Carter, I.M.S., in his 86th year.

GARROD.—On Jan. 25th, killed by shell in France, Alfred Noel Garrod, M.R.C.S., Lieutenant, R.A.M.C., 100th Field Ambulance, aged 28 years.

KIRKWOOD.—On Jan. 30th, at Peterborough, George Kirkwood, M.D. Edin., aged 63 years.

LOVELL.—On Jan. 28th, at Holmdale-road, West Hampstead, Francis Henry Lovell, Kt., C.M.G., F.R.C.S. Eng., LL.D., in his 72nd year.

STONHAM.—On Jan. 31st, at Harley-street, Colonel Charles Stonham, C.M.G., F.R.C.S. Eng., A.M.S., after severe illness contracted while serving with the forces in Egypt, aged 55 years.

TILDESLEY.—On Jan. 27th, at Lyndhurst, Willenhall, Josiah Percival Tildesley, M.B. Lond., D.P.H. Oxon., M.R.C.S. Eng., L.R.C.P. Lond., Medical Officer of Health for Willenhall.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

BOOKS, ETC., RECEIVED.

FORD AND SON, Drummond-street, Melbourne.
Medicine and Meditation: Occasional Writings. By Alex Lewers, M.R.C.S. Eng., L.R.C.P. Lond., D.P.H., Senior Honorary Physician to St. Vincent's Hospital, Melbourne.

GRIFFIN, CHARLES, AND CO., London.
An Inquiry into Statistics of Deaths from Violence. By William Brend, M.A., M.D., B.Sc. Lond. Price 3s. 6d. net.

HEFFER, W., AND SON, Cambridge.
For Soul and Body: Talks on Spiritual Healing. By Harriette Bainbridge. With Foreword by G. F. C. Searle, Sc.D., F.R.S. Price 9d.

JARROLD AND SONS, London.
The Coming End of the Age. By Dr. C. Williams. Price 1s. net.

MILFORD, HUMPHREY, Oxford University Press, London.
Pathology and Treatment of So-called Nervous Asthma. By J. B. Berkart, M.B. Price 2s. 6d. net.

PUBLISHED BY AMERICAN JOURNAL OF VETERINARY MEDICINE, Chicago.
Wound Treatment. By L. A. Merillat and others.

G. P. PUTNAM'S SONS, London and New York.
A Quiz Book of Nursing for Teachers and Students. By Amy Elizabeth Pope and Thirza A. Pope. Second edition, revised and enlarged.

RIVERDALE PRESS, Brookline, Mass.
Transactions of the American Urological Association, Fourteenth Annual Meeting at Baltimore, Maryland, April, 1915.

WOODALL, MINSHALL THOMAS, AND CO., Oswestry.
Calendar of the University of Wales, 1915-16.

Notes, Short Comments, and Answers to Correspondents.

HEALTH OF THE GOLD COAST, ASHANTI, AND THE NORTHERN TERRITORIES.

THE Gold Coast Blue-book for 1914 has recently been received at the Colonial Office, together with separate reports on the Gold Coast dependencies—Ashanti and the Northern Territories. It appears from these that the entire population at the last Census in 1911 amounted to 1,503,386. The number of European residents in the colony proper in 1914 was 2083, in Ashanti 440, and in the Northern Territories 122—total 2645, as compared with 2590 in 1913. The death-rate amongst Europeans was 12·47 per 1000 and the invaliding-rate 35·53 per 1000. There were 11 deaths among European officials, 1 being due to yellow fever, 1 to blackwater fever, 2 to subtertian malaria, 2 to heart failure, 1 to septicæmia, 1 to aneurysm, 1 to appendicitis, 1 to accidental drowning, and 1 to suicide. Of 24 officials invalided, 2 were for malaria, 3 for blackwater fever, 1 for neurasthenia, and 18 for various other diseases. Of 77 non-officials invalided, 2 were for enteric fever, 5 for malaria, 2 for yellow fever, 4 for blackwater fever, 1 for dysentery, 6 for anæmia, 4 for gastritis, and the remainder for various other diseases. The number of Europeans coming under treatment was 1607, as compared with 1179 in 1913. No means exist whereby accurate statistics relating to the health of natives can be obtained. During 1914, 29,392 natives were treated in the hospitals and dispensaries of the colony, as compared with 26,661 in the previous year. A new hospital for Europeans has been built at Accra. The Gold Coast and its dependencies were free from any serious outbreak of epidemic disease during the year. The number of successful vaccinations performed was 5147. Thirteen cases of sleeping sickness were reported, 5 of which terminated fatally. Nineteen cases of yellow fever were reported, 9 of which were Europeans, and there were 9 deaths, 4 among Europeans and 5 among natives. The rainfall registered at 12 of the principal stations ranged from 24·58 inches at Accra to 55·0 inches at Kintampo, whilst at the thirteenth station, Axim, it was 116·98 inches. The sanitary conditions of the Colony, Ashanti, and the Northern Territories show generally an improvement, especially in the more populous centres. On the subject of climate it is pointed out that "the Gold Coast is peculiarly free from many of the discomforts associated with tropical countries: hot nights and intense heat by day are the exception rather than the rule, while insects are comparatively unobtrusive. There is, however, an insidious quality in the climate, lowering the vitality of Europeans and rendering them an easier prey to mosquito-borne diseases than in many tropical countries where the discomforts of the climate are more obvious. The efforts of the sanitary and medical authorities in promoting hygiene and treatment of disease continue to exercise a beneficial effect on the general health of Europeans. Native aspirants to various kinds of employment, skilled and unskilled, being plentiful it is not the policy of Government to encourage European immigration; and, living being expensive, it is highly inadvisable for Europeans in search of employment to come to the colony without previous engagement by Government or representatives of mercantile firms in Europe."

Mr. F. C. Fuller, C.M.G., Chief Commissioner in Ashanti, in his separate report on that dependency, observes that "the climate of Ashanti is not suited for permanent European settlement. The average stay in the country is 12 months, after which recuperation in a more bracing climate is necessary. The European community consists exclusively of officials, merchants, miners, and missionaries." He adds that the only Government hospital for Europeans in Ashanti is at Kumasi, but hospitals for natives are established at Sunyani, Kintampo, Obuasi, and Kumasi. At the two latter places there are also infectious diseases hospitals. During 1914 7 cases of trypanosomiasis were reported in Ashanti, with 3 deaths. There was a small outbreak of small-pox at Ayenim Mine—8 cases in all, among natives, and no deaths. Only 8 cases of leprosy were reported (all of the anæsthetic variety), but there can be no doubt that the disease is prevalent among the natives, especially in the vicinity of the Sacred Lake. Mr. Fuller testifies to the eagerness of the Ashantis to improve their towns, and credits them with being cleanly in person, whilst they are quickly learning to become more particular with regard to their material surroundings. They are fast becoming regular meat-eaters, and fresh meat can now be

procured daily in every village of importance. The exportation of snails is an increasing trade from Ashanti. The snails are shelled, skewered on sticks, and smoke-dried. When thus prepared they are considered a great delicacy by the natives. The best quality come from Wam and the Ahafo forest in Western Ashanti. They are brought to Kumasi, whence they find their way all over the colony.

The following passages occur in the separate report of Captain C. H. Armitage, C.M.G., D.S.O., Chief Commissioner, on the affairs of the Northern Territories: "There are Government hospitals at Tamale, Salaga, and Bole in the Southern Provinces; at Wa, Lorha, and Tumu in the North-Western Province; and at Zouaragu and Gambaga in the North-Eastern Province. The hospitals at Navarro and Bawku in the last-mentioned province were closed during the year owing to the dearth of medical officers, but both buildings were kept in repair and reopened. The native attendance at these hospitals increases yearly ..... A disease, reported in 1913 as having broken out in a small village near Yeji, and which was said to resemble strongly pestis bubonica, made its appearance at the fishing village of Makongo, also near Yeji, in May, 1914. The investigating medical officer saw 4 cases, 1 of which proved fatal, whilst 5 cases, of which 4 ended fatally, had been reported previous to this. ..... Leprosy is not on the increase, and, while uncommon in the Southern and North-West Provinces, is of more frequent occurrence in the North-East Province. The natives look upon it as 'a visitation of Allah,' but say that it shows no signs of spreading, and are generally averse to compulsory isolation. ..... An outbreak of anthrax, which attacked both man and cattle, occurred in the Kanjarga district of the North-Eastern Province and was responsible for a number of deaths in both instances. The district was visited by the veterinary officer, who inspected the herds and gave advice to the native owners as to the preservation of health among their cattle. Apart from this outbreak the general health of the natives may be described as good. ..... To procure an adequate and good supply of water is a serious problem throughout the Northern Territories. In the rainy season there is more than an adequate supply, but for several months of the dry season and away from the large rivers water becomes so scarce that in many cases it amounts to a famine, and exorbitant prices are asked for a calabash of water. It is all surface water. The first difficulty is to find water, and, when found, then to prevent the well being filled up with earth after the first rains. To prevent this calamity the sides of the well must be lined with stone and cement, and a stone and cement coping and apron made. ..... At any cost the most pressing necessity now is the travelling around the Northern Territories of an experienced Public Works Department official to make properly constructed wells at each station. The provincial medical officer writes: 'Until the material for boring artesian wells has been provided, I fear that we shall never be free from the spectre of a water famine. Even at Tamale, during the dry season, the natives camp out all night round the wells and water holes to secure a calabashful of water as it slowly percolates through the sandstone, and free fights are of common occurrence, when pots are broken and valuable water spilled.'"

ECONOMY IN SMALL QUANTITIES.

IN one of the series of the short lectures delivered at the Institute of Hygiene in connexion with the Domestic Economy Exhibition, the principal of the institute, Mr. J. Grant Ramsay, emphasised the economy of small purchases. In France one could buy the wing of a fowl or the leg of a rabbit, and consequently an invalid in poor circumstances could have a delicacy which would otherwise be beyond his means. In some of the London shops this system was being introduced, and it was now possible to buy a quarter of a fowl. The French system had many other advantages, for it was not good to have food over from day to day. This teaching is rather disconcerting to the householder who thinks he can save 10 per cent. by getting 10 per cent. discount on quantity. The housewife, however, who sees the last portion of the sack or barrel getting dry or dusty or otherwise spoiled by exposure will be inclined to agree with the lecturer.

PHYSICAL TRAINING.

THE appearance of a manual of physical training by a medical man, with a portrait of the author on the cover and 46 others in the text, would be something of a portent, but reference to the Army List leads to the discovery that Lieutenant C. F. Upton, the author of a work entitled "The British Manual of Physical Training" (London: T. Werner Laurie, Limited. Pp. 91. Price 2*s.* net), is a quartermaster in the Royal Army Medical Corps, with the title of honorary lieutenant. Whilst there is a close resemblance between the author's system and other systems of physical training there is a quantity of plain common sense within the two covers of the book. To take a single example, the sedentary worker of reasonable hours is addressed as follows: Now, if within walking distance of business, by all means walk, and briskly at that, and, if a train journey is necessary, instead of going all the way by train, only go some of the way and walk the rest." We think that if the reader has already been in the habit of following this and similar rules of hygienic life he will hardly require to follow the systematic exercises at all, but this strikes at the root of all "systems" of physical training. The crude remarks on woman's vocation and the spelling of the names of many of the muscles given may naturally provoke criticism. But for the rest, there is nothing in the author's directions the following of which could do harm, and the muscular exercises he describes are simple and useful.

THE MISSION HOSPITAL, MIRAJ.

IT is now some 25 years since medical missionary work was commenced in Miraj, India, by Dr. W. J. Wanless, who, together with his colleague Dr. C. E. Vail, signs the Medical and Surgical Notes, 1913-14, of the Presbyterian Mission Hospital, published by the Mission Press, Ahmadnagar. During a quarter of a century much good medical work has been done at this mission and a classified table of operations for 22 years shows a total of 9441 cases. In 1914 there were 283 medical cases out of a total of 1816 in-patients. The operations performed in hospital were 3009, of which 1636 were ophthalmic operations, including 614 for cataract. The mortality was 2·75 per cent., inclusive of 281 abdominal operations and exclusive of 1636 ophthalmic operations with no mortality. Of 44 operations for appendicitis the only fatal case was one with septic peritonitis. Gynæcological operations numbered 198, of which 133 were abdominal sections. In 31 hysterectomies there were 3 deaths.

Justice.—It seems to us that A can fairly refuse to take the patient. We assume that C is not giving up his practice in order to take a Commission.

F.R.C.S.—One article appeared in THE LANCET of June 19th, 1915. The other is receiving consideration.

K.—We fear the amusing verses would not be considered very suitable for our columns.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Papers:—Lord Rayleigh, O.M.: The Theory of the Helmholtz Resonator.—Sir N. Lockyer and Mr. H. E. Goodson: On the Oxyhydrogen Flame Spectrum of Iron.—Mr. W. G. Duffield and Mr. M. D. Waller: The Consumption of Carbon in the Electric Arc. II., The Anode Loss (communicated by Sir E. Rutherford).—Mr. C. H. Lander: Surface Friction. Experiments with Steam and Water in Pipes (communicated by Prof. J. E. Petavel).—Mr. T. R. Merton: On the Structure of Broadened Spectrum Lines (communicated by Prof. A. Fowler).

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY.—9 P.M., Lettsomian Lecture:—Major F. W. Mott: The Effects of High Explosives on the Central Nervous System. (Lecture I.)

HUNTERIAN SOCIETY, 1, Wimpole-street, W.

WEDNESDAY.—9 P.M., Annual Oration:—Dr. A. S. Currie: The Spirit and Inspiration of William and John Hunter.

ROYAL SOCIETY OF ARTS, John-street, Adelphi, W.C.

WEDNESDAY.—4.30 P.M., Paper:—Prof. J. A. Fleming: The Organization of Scientific Research.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations. Dr. Simson: Diseases of Women.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Addison: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis. Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. E. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans); Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

TUESDAY.—4 P.M., Dr. C. Kempster: X Rays. Rodent Ulcer and Malignant Diseases.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W.

TUESDAY.—3 P.M., Prof. C. S. Sherrington: Nerve Tone and Posture. (Lecture IV.)

For further particulars of the above Lectures, &c., see Advertisement Pages.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, AND WHEN ACCOMPANIED BY BLOCKS IT IS REQUESTED THAT THE NAME OF THE AUTHOR, AND IF POSSIBLE OF THE ARTICLE, SHOULD BE WRITTEN ON THE BLOCKS TO FACILITATE IDENTIFICATION.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale, and advertising departments of THE LANCET *should be addressed "To the Manager."*

We cannot undertake to return MSS. not used

MANAGER'S NOTICES.

THE INDEX TO THE LANCET.

THE Index and Title-page to Vol. II. of 1915 were given in THE LANCET of Dec. 25th, 1915.

VOLUMES AND CASES.

VOLUMES for the second half of the year 1915 are now ready. Bound in cloth, gilt lettered, price 16*s.*, carriage extra.

Cases for binding the half-year's numbers are now ready. Cloth, gilt lettered, price 2*s.*, by post 2*s.* 4*d.*

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Advertisements (to ensure insertion the same week) should be delivered at the Office not later than Wednesday, accompanied by a remittance.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Feb. 2nd, 1916.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks
Jan. 27	30·206	S.W.	...	55	53	46	47	48	Overcast
,, 28	30·306	W.	0·03	59	54	48	49	50	Overcast
,, 29	30·342	W.	...	77	54	47	46	48	Cloudy
,, 30	30·410	S.W.	...	46	45	42	41	43	Cloudy
,, 31	30·564	S.W.	...	45	45	42	41	42	Overcast
Feb. 1	30·454	E.	...	48	44	41	39	42	Overcast
,, 2	30·100	S.W.	...	54	47	35	39	41	Overcast

Communications, Letters, &c., have been received from—

A.—Messrs. Allen and Hanburys, Lond.; Dr. M. Afifi, Abbassia; Messrs. Arnold and Sons, Lond.; Anglo-Russian Hospital, Lond., Secretary of; Anglo-American Pharmaceutical Co., Lond.; Ardath Tobacco Co., Lond.; American Women's War Relief Fund, Lond., Executive Committee of.

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E.—Eugenics Education Society, Lond.; Établissements Excel, Paris.

F.—Dr. R. W. Fisher, Frimley; Messrs. F. H. Faulding and Co., Lond.; Mr. J. Fredericks, Hayes; Dr. W. E. Fothergill, Manchester; Dr. John Fraser, France.

G.—Messrs. Chas. Griffin and Co., Lond.; Lieutenant A. C. Gray, R.A.M.C.; Major Charles Goddard, R.A.M.C.(T.); Messrs. Gordon and Gotch, Lond.; Sir James Goodhart, Lond.; Dr. Wightman Ginner, Cannes; Mr. Ernest Gregory, Boston; Dr. G. L. Gulland, Edinburgh.

H.—Messrs. A. Heywood and Son, Manchester; Highlands and Islands (Medical Service) Board, Edinburgh, Secretary of; Lieutenant H. R. Hurry, R.A.M.C., Doncaster; Hulme Dispensary, Manchester, Hon. Medical Secretary of; Hasluck's Academy, Lond.; Hunterian Society, Lond.; Sister M. C. Harris, Leicester; Messrs. C. J. Hewlett and Son, Lond.; Messrs. Holt and Co., Leicester; Dr. John Haddon, Denholm; Dr. Jamieson B. Hurry, Reading; Mr. Clement A. Harris, Crieff.

J.—Surgeon-General A. Johnston, R.N., Chatham; Justice; Mr. L. Jenkins, Swansea; Mr. Charles Joyce, Newport.

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